

Tidewater Laboratory Services

Naval Medical Center, Portsmouth, VA



LABORATORY DIRECTORY OF SERVICES & SPECIMEN COLLECTION MANUAL



MAY, 2011

**LABORATORY DIRECTORY OF SERVICES
NAVAL MEDICAL CENTER
PORTSMOUTH, VA 23708**

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AN INTRODUCTION FROM THE LABORATORY

As the Laboratory Medicine Department, we are the first DoD/VA Laboratory System serving all TRICARE and VA eligible members in the Tidewater region using state-of-the-art business models and technology to provide the highest quality patient care.

This Laboratory Directory of Services is designed to give information to the user so that one may better understand laboratory operations, specimen requirements, and collection procedures. It is designed to be a ready reference should laboratory questions arise within the Medical Center or any of its Branch Health Clinics.

Knowledge, planning, and preparation are keys to collection and submission of laboratory specimens. The information contained in this manual will provide the foundation. Therefore, it is essential that all personnel read through this manual and review it frequently.

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INTRODUCTION

I. PURPOSE

The information in this manual is designed to provide users with the current specimen collection policies and procedures of the Naval Medical Center, Portsmouth (NMCP) Laboratory Department. This book is reviewed, revised and approved annually (or whenever necessary) by the Laboratory Manager, the Department Head/Medical Director and the Performance Improvement/Quality Assurance Coordinator. All NMCP Laboratory personnel review this book upon check-in or whenever revisions are made.

Note: NMCP includes the Charette Health Care Center and its Branch Health Clinics.

II. ORGANIZATION

See the organizational chart on the following page. Laboratory Client Services is available to our hospital staff and patients for "one stop shopping" assistance. To contact laboratory services during normal working hours, call 953-1621 or 953-6244. For Pathology issues contact at 953-1527. If after normal working hours, page 314-8445 for the senior tech on duty and immediate assistance will be provided. Laboratory Client Services will follow-up on the matter the next working day.

III. HOURS OF OPERATION

- A. The Laboratory is staffed 24 hours a day.
- B. Regular duty hours with full staff are Monday through Friday, 0700 - 1530, except on holidays.

Note: Please be sure to make contact with a Laboratory Representative when dropping of a specimen.

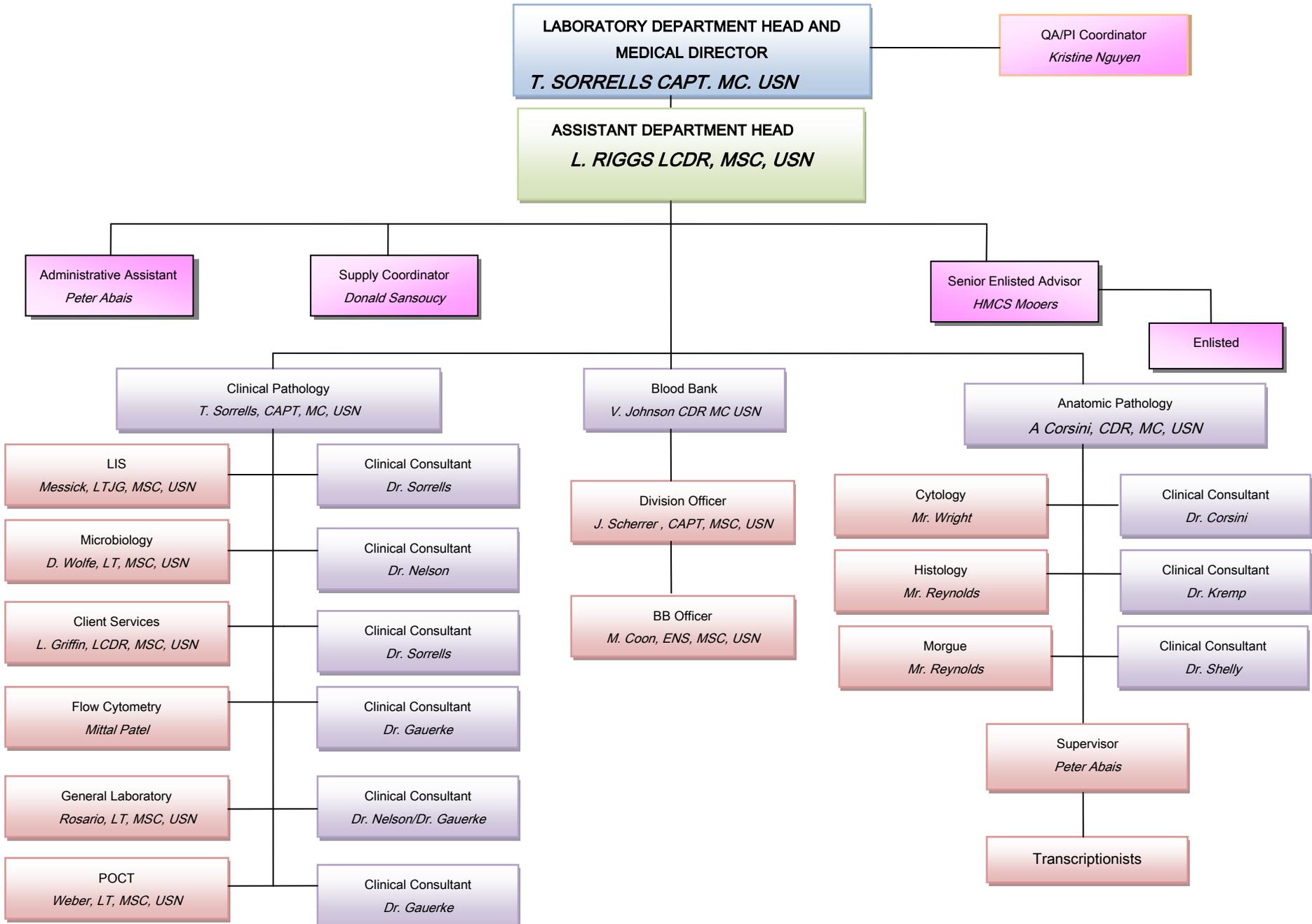
- C. Outpatient phlebotomy is performed in the Laboratory's Outpatient Phlebotomy section located on the first floor, North Mall of the Charette Health Care Center:

0630 - 1800 Monday through Friday
Closed on weekends and holidays.

- D. A staff pathologist is available by pager 24 hours a day, 7 days a week at 314-8694. A senior enlisted technician is onboard 24 hours a day, 7 days a week, and can be reached at pager 314-8445.

NMCP LABORATORY ORGANIZATION CHART

OCT 2011



SPECIMEN SUBMISSION AND LABELING

I. PRINCIPLE

The following procedure is provided to ensure the quality and proper identification of the specimen(s) presented to or collected by Laboratory Medicine.

II. PURPOSE

To establish uniform procedures for requesting laboratory studies and handling laboratory specimens for all outlying Branch Health Clinics and Naval Medical Center Portsmouth.

III. PROCEDURE

A. The following is the minimum information required on all request chits for submission of specimen(s) to the clinical pathology laboratory. Paper request chits will only be accepted from civilian providers, outlying areas that do not have CHCS capability or when CHCS is not functioning. All other requests for laboratory work MUST be requested via CHCS:

NOTE: If the patient is unable to understand the English language or is hearing impaired, please contact the OOD desk (ext. 3-5008) for an interpreter.

1. Patient's last name, first name and middle initial.
2. Sponsor's social security number plus family member two digit prefix code.

RELATIONSHIP TO SPONSOR	PREFIX CODE
Sponsor (Active Duty, reserve and retired Uniformed Services Personnel: Army, Navy, Air Force, Marine Corps, Coast Guard, Public Health Service and National Oceanic and Atmospheric Administration)	20
Spouse (first, if eligible)	30
Subsequent spouses	31, 32, etc.
Oldest child (includes stepchildren)	01
Subsequent children	02, 03, 04, etc.
Dependent Mother	40
Dependent Father	45
Dependent Mother-in-law	50
Dependent Father-in-law	55
Other authorized dependents	60, 61, 62, etc.

All other authorized personnel (Foreign Nationals: Including Foreign Military, Civilian Humanitarians, DOD civilians, etc.)	20
First beneficiary authorized by statute	90
All others, not elsewhere classified	99
Civilian employees	98

3. Requesting Wards/Clinics

a. Hospital Wards/Clinics

- (1) Orders must be entered into CHCS. Paper chits are unacceptable unless CHCS is not functioning. Verbal or phone orders are not acceptable. Any verbal communication will be to confirm the status of a sample on-hand or other general communication related to testing requirements. However, as noted above, orders must be entered into CHCS.
- (2) Orders that are over 90 days will not be utilized. Orders over 360 days will automatically delete from the system.

b. Outlying Clinics, Commands and Civilian Providers

- (1) Civilian providers must include complete mailing address, phone and fax numbers. Request chit/prescription should include civilian DEA number so the provider can be entered into CHCS.
- (2) Military commands must include the complete mailing address, including the name of the ship, etc., for which results are to be forwarded.

4. Health record location (where health record is maintained).
5. Date of birth
6. Sex (reference values and follow-up testing depend on this information).
7. Requesting physician's last name, first initial and last six (6) digits of SSN.
8. Request date
9. Date and time specimen(s) collected.
10. Test(s) requested.
11. Specimen source (microbiology and body fluid specimens). Medication(s) patient is taking. This is especially important for microbiology and coagulation specimens.
12. Any additional information that would aid in the interpretation of test results.

B. CHCS down time procedures:

The following request chits are used **ONLY** when CHCS is not operational and cover the majority of laboratory tests performed:

1. NAVMEDCEN PTS 6510/58 (REV 7/93) ROUTINE REQUEST
2. NAVMEDCEN PTS 6510/54 (REV 7/93) URGENT REQUEST
3. NAVMEDCEN PTS 6510/52 (REV 9/93) EMERGENCY REQUEST

C. All specimens will be submitted to the Laboratory with the following information on the label:

1. Patient's last name, first name, middle initial.

2. Sponsor's Full SSN with 2-digit prefix.
3. Date and time specimen was collected.
4. Location where collected.
5. Initials of person collecting the specimen. Specimens for Transfusion Service require the signature of the phlebotomist on the label (NAVMEDCENPTSVAINST 6530.3D).
6. Initial of second verifier (can be staff, patient, parent/guardian).

Note: Before transporting to the Laboratory, place all specimens into a sealed leak-proof primary container as appropriate for the specimen. Place it into a leak-proof secondary container (e.g., a Ziploc plastic bag) along with the request.

D. Special Requests:

1. Consults (SF 513) must contain the patient's clinical history relevant to the tests requested.
2. Microbiology slides will be labeled with the date slide was prepared and patient's last name and first initial. The Laboratory will add the full laboratory accessioning number. Using a pencil, write the information on the frosted end of the slide only. Do not use a pen or paper labels.

E. Test Priorities:

1. **Routine/pre-op:** Routine requests performed have a maximum allowable turnaround of one workday (24 hours). Some specialized testing may take longer. Refer to LTI in CHCS for further details.

Note: All requests presented to the Laboratory without a priority assigned will be treated as a routine request.

2. **Urgent/ASAP:** Tests that are needed to make a decision or take rapid action to prevent clinical deterioration of a patient should be requested ASAP. Turnaround time is within four (4 hours) with results posted in CHCS. If CHCS is down, results will be telephoned to the requesting physician or the requesting location.
3. **STAT/Emergency:** STAT/Emergency requested tests should only be used to provide information necessary for treating a patient with a life or limb threatening situation. Maximum turnaround time is 60 minutes from time in lab and results will be posted in CHCS. If CHCS is down, the results will be telephoned to the requesting provider or the requesting location. If a significant delay in turnaround time is anticipated due to unforeseen circumstances, such as instrument malfunction, the Laboratory will telephone the requesting location. If a significant proportion of our provider's network is affected, a message will be placed in CHCS.

Note: Turnaround time is based on the time the specimen is received in the Laboratory department.

F. Specimen Labeling

1. Labeling of the specimen must be done at the patient's bedside/in the presence of the patient. **Note:** Some specimens (e.g., PAP smears) have unique labeling requirements as indicated throughout this document.

2. **No specimen will be accepted that does not have at least the COMPLETE NAME and COMPLETE SSN with prefix. The last four digits of the SSN are unacceptable.** Only in dire circumstances will a mislabeled specimen be tested. The laboratory recognizes that there are occasionally rare or extremely difficult specimens that may be submitted without proper identification (e.g. CSF, neonatal specimens, tissue biopsies, blood cultures and other body fluids). In these cases there may be an exception to these rules. The HCP or Registered Nurse in care of the patient **will be required** to report to the Laboratory and positively identify the specimen. A waiver accepting responsibility for the specimen integrity will be signed and the laboratory will generate a QCR. According to NAVMEDCENPTSVAINST 6530.3 series, there are **NO EXCEPTIONS** in regards to specimens for Blood Bank. Mislabeled PAP smears will also be summarily rejected. **Unlabeled specimens are not acceptable. All specimens that arrive unescorted (i.e., via the tube system or simply dropped off at the receiving window) that are not labeled will be discarded. NO EXCEPTIONS.**

I. Causes for sample rejection:

Specimens will be rejected for analysis when the following conditions exist:

1. Quantity insufficient for proper performance of requested test.
2. Specimens improperly labeled, unlabeled, or with specimen/label discrepancies (specimens will not be returned).
3. Specimens that are clotted, grossly-hemolyzed.
4. Specimens with request forms improperly filled out.
5. Culturette™ swabs that have been allowed to dry out or have not been submitted within 24 hours of specimen collection.
6. Sputum specimens for routine culture with greater than 25 epithelial cells per low power field or no evidence of white cells.
7. Urine cultures submitted in non-sterile cups (household jars) or submitted in leaky containers.
8. Fecal specimens submitted in anything other than a sterile specimen cup. **Exception: Fecal swabs are permitted on infants.**
9. Grossly contaminated specimens.
10. Viral or Chlamydia cultures that are not submitted in the proper transport media.
11. PAP tests with labeling discrepancies.
12. UNSATISFACTORY specimens for anaerobic cultures are: Throat, Nasopharyngeal swabs, Gingival swabs, sputum or Bronchoscopic

specimens, gastric contents, feces, rectal swabs, vaginal or cervical swabs.

13. Any specimen that is not submitted according to collection criteria.

H. Laboratory procedure for unacceptable specimens:

1. The Laboratory will contact ward or clinic, explain the problem, and request another specimen.
2. Upon receipt of the new specimen, the unacceptable specimen will be discarded.
3. If a new specimen is not obtained, the test will be cancelled with documentation in CHCS regarding the reason for rejection and the person that was notified. If the clinic is closed, the Laboratory staff will contact the clinic on the next working day.
4. Specimens from unknown locations will be retained for one week (or less if specimen integrity is compromised by storage) if they are identifiable by name and SSN.
5. Refer to Appendix B, NAVMEDCENPTSVAINST 6530.4 series for sample collection and submission for Blood Bank testing.

IV. COMPUTERIZED TUBE SYSTEM

- A. Specimens for laboratory testing may be hand-delivered from the wards/clinics/other laboratories/other requesting locations to the Laboratory in compliance with the current NMCP Infection Control policy on proper handling of laboratory specimens. Specimens may also be delivered through the Computerized Tube System. Please refer to NAVMEDCENPTSVAINST 11301.1 series.
- B. Important Laboratory Station Location Codes:
12 Specimen Receiving
13 Blood Bank
14 Histopathology
- C. If the sender contacts the Laboratory and discovers a tube carrier has not arrived at the laboratory location, it is the sender's responsibility to locate the carrier. The sender must contact Systems Control at extension 3-0050, who will locate the carrier and send it to the Laboratory. Systems Control is available 24 hours per day.
- D. If a carrier is accidentally received at an incorrect station, forward to the appropriate station. If the sending/receiving station is unknown, contact Systems Control, extension 3-0050, to track and identify the sender station address in order to return the carrier.
- E. Before transporting the specimen to the laboratory, place all specimens into a sealed leak-proof primary container as appropriate for the specimen. Place it into a leak-proof secondary container (e.g. a Ziplock plastic bag) along with the request.

F. The following specimens can not be transported via tube system:

1. 24 Hour Urine
2. Any preserved specimen with formalin or alcohol
3. Body fluids/CSF
4. Large definitive surgical resections

NOTE: Any specimen that could not be easily re-collected should be hand carried to the laboratory as specimen may leak or break during transport in the pneumatic tube system.

G. If CHCS is down, the tube system is turned off.

LABORATORY POLICY ON TELEPHONE REPORTS OF LABORATORY RESULTS

I. POLICY

- A. Per reference (a) and (b), any credentialed medical staff of NMCP, including its Branch Clinics, with clinical privileges may receive laboratory test results via the telephone. Credentialed medical staff includes the following:
 - 1. Physicians
 - 2. Dentists
 - 3. Nurse Practitioners
 - 4. Nurse midwives
 - 5. Nurse anesthetists
 - 6. Clinical psychologists
 - 7. Optometrists
 - 8. Clinical dietitians
 - 9. Podiatrists
 - 10. Clinical social workers
 - 11. Physical therapists
 - 12. Occupational therapists
 - 13. Audiologists
 - 14. Speech pathologists
 - 15. Physician assistants
 - 16. Independent Duty Corpsman (IDC)

- B. Request for laboratory test results via telephone will be referred to Laboratory Client Services at 953-1621 during normal working hours. After hours, these calls should be referred to the senior laboratory technician, pager # 314-8445.

- C. Client Services, or the senior tech, are authorized to provide laboratory test results to the above credentialed medical staff. A reasonable attempt must be made to verify the identity and credential status of the requester.

- D. Client Services or the senior technician are also authorized to provide laboratory results to registered nurses. They are to verify the identity and status of the requester.

- E. Client Services, or the senior technician, are also authorized to provide laboratory test results to military HCP's out in the fleet who are not credentialed at NMCP but who have submitted laboratory requests for their patients.

- F. Civilian HCP's who request laboratory test results originally ordered by another HCP and are not credentialed at NMCP must submit a Patient Release Form signed by the patient before laboratory test results are released by phone, fax, or written report. The civilian HCP should already have this form in their office. If the same civilian HCP requesting the Laboratory results originally ordered the Laboratory tests, they may be released by fax or written report.

- G. All facsimile and written patient reports to be released should be accessed from CHCS through "^PEC." Reports accessed through "^PLI" are not official documents.
- H. LABORATORY REPORTS WILL NOT BE GIVEN TO THE PATIENT BY PHONE, FAX, OR WRITTEN REPORT. If the patient presents with a prescription where the provider authorizes them to receive the report, Client Services will print the report and fax the report to the requesting HCP.
- I. All patient information and results will be handled in accordance with NMCP's policy on the Health Insurance Portability and Accountability Act of 1996.

II. **REFERENCES :**

- A. Privacy Act of 1975 (PL93-579)
- B. Naval Medical Center, Portsmouth VA Medical Staff Bylaws, 1995

POLICY REGARDING TESTS ORDERED BY NON-MILITARY PROVIDERS

The Laboratory Medicine Department will accept all laboratory requests from TRICARE patients (Prime, Extra, and Standard/Champus) and other eligible beneficiaries (e.g., retirees with Medicare). This includes performance of the in-house test menu and most mailout testing. Patients will be asked to complete a form for third party billing if they have supplemental insurance.

GUIDELINES FOR COLLECTION OF LABORATORY SPECIMENS

I. PURPOSE

To provide general guidelines on proper collection of specimen(s) frequently submitted to the Laboratory Medicine Department. For additional specific information on individual test requirements, refer to Appendix A or contact Client Services at 953-6244/1621. Additionally, all sample requirements may be accessed via CHCS. In the event that CHCS is down, please contact Specimen Processing at 953-6244.

To access individual test requirements in CHCS:

- A. From the main menu in CHCS enter ^LTI.
- B. Enter in desired test. CHCS will display the pertinent information for the desired test (e. g., Specific tube, minimum sample, turn-around-time).
- C. The laboratory has a list of current test methods and performance specifications available to clients upon request. If the laboratory significantly changes analytical methodology or test interpretation, clients will be notified via ALLMAR (Outlook) e-mail accounts. If the client does not have access to such an account, a direct mailing will be available upon request.
- D. The Laboratory has reviewed its phlebotomy practices to minimize unnecessary large blood draw volumes. As a result of the review, minimum amount of specimen is published in CHCS to encourage hospital staff to avoid large blood draw volumes. This laboratory selects instrumentation that employs microsampling so as to minimize specimen requirements for testing. If still unclear, please contact Laboratory Client Services at 3-1621, or 1622. If analytic methodology is changed so that test results or their interpretations may be significantly different, health care providers are notified of such change by an associated comment with every patient report and an e-mail notification via the Naval Medical Center Portsmouth Information System (CHCS). Upon request, Client Services will provide information to clients regarding test methodology and performance specifications (interference and limitations).

LABORATORY BLOOD SPECIMEN COLLECTION REQUIREMENTS

TEST NAME	REQUIREMENTS
17 HYDROXY CORTICOSTERIOD & KETOSTEROID	DEPARTMENT: Mail out PREPARATION: If possible, all drugs should be withheld for 72 hours prior to and during collection of urine. SPECIMEN VOLUME & TYPE: Urine (24-hour) CONTAINER: Plastic urine container, acquire from Lab receiving.
17 HYDROXYPROGES-TERONE	DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 0.3 ml serum CONTAINER: Red-top tube, SST, or lavender (EDTA) tube.
5 HIAA (QUANTITATIVE)	DEPARTMENT: Mail out PREPARATION: Avoid bananas, avocados, plums, eggplant, tomatoes, pineapple, walnuts, and interfering drugs for a 72-hour period prior to and during the collection. SPECIMEN VOLUME & TYPE: 24 hour urine CONTAINER: Plastic Urine container WARD REMARKS: 30mL 6N HCL or 1g/L boric acid may be added as preservative for other tests without harm to 5-HIAA.
ABO GROUP & RH TYPE	DEPARTMENT: Blood Bank SPECIMEN VOLUME & TYPE: 6mL whole blood CONTAINER: Pink (K ₂ EDTA) tube WARD REMARKS: If transfusion may be required, 6530/9 Request for Blood Products must accompany specimen. See Type and Screen.
ACETAMINOPHEN	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 2ml serum CONTAINER: Plain red WARD REMARKS: no gel tubes accepted. To determine toxicity, collect 1 specimen 4 to 6 hrs after ingestion & another specimen 7 to 10 hrs after ingestion.
ACETONE, SERUM	Refer to Ketone, serum
ACETONE, URINE	Refer to Ketone, urine
ACID PHOSPHATASE	DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 2ml serum CONTAINER: Red-top tube or SST WARD REMARKS: Must be placed on ice immediately and transported directly to laboratory.
ALANINE AMINOTRANSFERASE (ALT, SGPT)	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 1ml serum or plasma CONTAINER: Red-top, SST, or green PST (Li Heparin) only
ALBUMIN	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 1ml serum or plasma CONTAINER: Red-top, SST, or green PST (Li Heparin) only
ALCOHOL- MEDICAL	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 7ml serum/plasma CONTAINER: Red top tube or SST, Gray (NaF or Potassium Oxalate) tube, or green PST (Li Heparin) WARD REMARKS: submit unopened tube only. Clean site with non-alcoholic soap only.

TEST NAME	REQUIREMENTS
ALCOHOL- MEDICAL (SERUM) for Branch Health Clinics only	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 7ml serum <u>CONTAINER:</u> Gray <u>WARD REMARKS:</u> do not open tube! Bring to lab immediately for processing. Clean site with non-alcoholic soap only.
ALCOHOL- MEDICAL (URINE)	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 10ml urine random <u>CONTAINER:</u> Urine cup <u>WARD REMARKS:</u> bring to laboratory immediately
ALCOHOL-LEGAL	Not performed by NMCP or BHCs. Contact lab for more information.
ALCOHOL-LEGAL AIRCRAFT MISHAP AFIP (WHOLE BLOOD)	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 7ml whole blood (2 tubes) <u>CONTAINER:</u> Gray (NaF or Potassium Oxalate) tube. <u>WARD REMARKS:</u> for aircraft mishap/competency for duty only...require AFIP Form 1323 chain of custody form
ALCOHOL-LEGAL AIRCRAFT MISHAP AFIP (URINE)	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 5ml urine, clean catch <u>CONTAINER:</u> Sterile urine cup <u>WARD REMARKS:</u> for aircraft mishap/competency for duty only...require AFIP Form 1323 chain of custody form
ALKALINE PHOSPHATASE	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2 ml serum or plasma <u>CONTAINER:</u> Red-top or SST, or green PST (Li Heparin)
ALKALINE PHOSPHATASE ISOENZYME	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 4 ml serum <u>CONTAINER:</u> Red-top tube or SST <u>PATIENT PREPARATION:</u> Patient should be fasting overnight. Patients who have B or O Blood group and secretions may have an elevated ALP about 2 hours after a fatty meal. <u>WARD REMARKS:</u> NOTE 1: Test should ONLY be ordered when Total Serum ALK PHOS is abnormal. Note 2: contraindication for ALKP isoenzyme panel: normal serum total ALKP Note 3: test includes relative % of liver, bone, and intestinal ALKP Bring specimen to laboratory within 1 Hour of collection
AFP, TUMOR MARKERS	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2 ml serum <u>CONTAINER:</u> Red-top tube or SST <u>WARD REMARKS:</u> This test does NOT provide serial monitoring.
ALPHA-1- ANTITRYPSIN	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 1 ml serum <u>CONTAINER:</u> Red-top tube or SST, no plasma <u>WARD REMARKS:</u> Overnight fasting specimen is preferred. No special patient prep necessary
AMIKACIN	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 1 ml serum <u>CONTAINER:</u> Red-top tube <u>WARD REMARK:</u> NO GEL TUBES ACCEPTED. Pharmacology (dosage

TEST NAME	REQUIREMENTS
	& time) sheet required. COMMENTS: Trough specimens should be drawn immediately prior to the next dose. Peak specimens should be drawn 1 hr after initiation of 30 minute infusion, or 30 minutes after longer infusions. . PLEASE LABEL TUBES APPROPRIATELY AS "PEAK" AND TROUGH"
AMINO ACID FRACTIONATION, QUANT, URINE	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 24hr urine (24 Hr) <u>CONTAINER:</u> 24 Hour Plastic urine container, No Preservative <u>WARD REMARKS:</u> obtain instructions and collection container from laboratory. Container must be labeled with patient's full name, date and time collection started and date & time collection finished.
AMINO ACID, FRACTIONATION, QUANT, PLASMA	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 4ml plasma <u>CONTAINER:</u> Green (Na heparin) tube
AMMONIA	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 4ml plasma, No hemolyzed specimens <u>CONTAINER:</u> Green PST (Li Heparin) <u>WARD REMARKS:</u> Specimen must be placed in a cup of ice & bring to lab within 10 minutes after collection for specimen processing. No short draw specimen accepted. <u>PATIENT PREPARATION:</u> Patient should be fasting 12-14 hours to avoid lipemia which interfere with the test. Patient should not clench fist during venipuncture.
AMYLASE, SERUM	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-Top tube, SST, or green PST (Li Heparin)
AMYLASE, URINE	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 24 hour Urine <u>CONTAINER:</u> 24 Hr plastic urine container, No preservative COMMENTS: obtain instructions and collection container from laboratory. Container must be labeled with patient's full name, date and time collection started and date & time collection finished.
AGIOSTENSIN-1-CONVERTING ENZYME (ACE)	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2mL Serum <u>CONTAINER:</u> Red-Top tube, SST. <u>PATIENT PREPARATION:</u> Stop administration of captopril, enalapril, or lisinopril for 12 hours prior to venipuncture (reduces ACE Activity)
ANTIBODY ID	<u>DEPARTMENT:</u> Blood Bank <u>SPECIMEN VOLUME & TYPE:</u> 6ml Whole blood <u>CONTAINER:</u> Pink (K ₂ EDTA) tube Comment: Antibody ID is automatically performed if antibody screen is positive.
ANTIBODY SCREEN	<u>DEPARTMENT:</u> Blood Bank

TEST NAME	REQUIREMENTS
(INDIRECT COOMBS)	<u>SPECIMEN VOLUME & TYPE:</u> 6ml whole blood <u>CONTAINER:</u> Pink (K ₂ EDTA) tube
ANTIBODY TITER	<u>DEPARTMENT:</u> Blood Bank <u>SPECIMEN VOLUME & TYPE:</u> 6ml whole blood <u>CONTAINER:</u> Pink (K ₂ EDTA) tube
ANTIGEN TYPING	<u>DEPARTMENT:</u> Blood Bank <u>SPECIMEN VOLUME & TYPE:</u> 6ml whole blood <u>CONTAINER:</u> Pink (K ₂ EDTA) tube
ANTI-THROMBIN III FUNCTIONAL/ IMMUNOLOGIC	<u>DEPARTMENT:</u> Special Coagulation <u>SPECIMEN VOLUME & TYPE:</u> 2.7 ml plasma <u>CONTAINER:</u> Light blue top <u>WARD REMARK:</u> Performed on Thursdays only
APTT (ACTIVATED PARTIAL THROMBOPLASTIN TIME)	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> Specimen tube capacity, plasma <u>CONTAINER:</u> Light blue (Sodium Citrate) tube <u>WARD REMARK:</u> FULL TUBE REQUIRED
ASPARTATE AMINOTRANSFERASE (AST, SGOT)	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or green PST (Li Heparin)
ASPERGILLUS (CF)	<u>DEPARTMENT:</u> Microbiology <u>SPECIMEN VOLUME & TYPE:</u> 3ml Cerebrospinal Fluid (CSF) <u>CONTAINER:</u> Sterile tube <u>WARD REMARK:</u> Send CSF to NMCP Lab within 30 minutes of collection. CSF Specimen can ONLY be accepted at NMCP LAB for Fungal AB Panel.
B12	<u>DEPARTMENT:</u> Special Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST Bring the Specimen to the laboratory within 45 minutes of collection for immediate specimen processing. <u>WARD REMARKS:</u> FASTING SPECIMEN PREFERRED. When collected with Folate order, wrap specimen in Aluminum foil to protect it from light.
B12 & FOLATE	<u>DEPARTMENT:</u> Special Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST <u>WARD REMARKS:</u> Wrap in aluminum foil to protect from light.
B12 BINDING CAPACITY	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST
BASIC METABOLIC PANEL	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or PST green (Li Heparin)
BILIRUBIN NEONATAL	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 1ml serum or plasma <u>CONTAINER:</u> Microtainer, red top tube or SST, or green PST (Li Heparin) (Preferred) <u>Ward Remarks:</u> Test limited to patients 2 weeks of age or

TEST NAME	REQUIREMENTS
	younger or for follow-up. Do not expose to light. Microtainer must be full.
BILIRUBIN, TOTAL	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or green PST (Li Heparin)
BILIRUBIN, DIRECT (Bc)	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or green PST (Li Heparin)
BLEEDING TIME	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> Special collection, call lab. <u>CONTAINER:</u> N/A (performed in lab)
BRAIN NATRIURETIC PEPTIDE (BNP) NT pro-BNP	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> specimen tube capacity, Plasma 2 mL, no hemolyzed specimens, No turbid specimens <u>CONTAINER:</u> Green PST (Li Heparin) only <u>WARD REMARK:</u> Only collect in plastic Li Heparin tubes because BNP is unstable in glass tubes!
BUN (BLOOD UREA NITROGEN)	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or green PST (Li Heparin)
C-PEPTIDE	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml Serum <u>CONTAINER:</u> Red-top tube or SST <u>WARD REMARK:</u> Fasting draw in chilled tube. Patient should be fasting. Bring specimen to laboratory immediately for special specimen processing.
C3	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2mL serum or plasma <u>CONTAINER:</u> Red-top , SST, or green PST (Li Heparin)
CALCITONIN	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml Serum <u>CONTAINER:</u> Red-top tube or SST <u>Ward Remark:</u> Patient must be fasting
CALCIUM	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or green PST (Li Heparin)
CALCIUM, URINE	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 24hr urine or 50ml random urine <u>CONTAINER:</u> Random specimen: Plastic urine container 24 Hours urine Specimen: Plastic urine container no preservative. <u>WARD REMARK:</u> Obtain 24HR plastic urine container and Instruction for collection in the Lab.
CALCIUM, IONIZED (For NMCP Only)	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 1ml plasma <u>CONTAINER:</u> Green Top (Sodium Heparin or Li Heparin) <u>WARD REMARK:</u> Place on ICE and Immediately transport to Laboratory. Delay in transporting specimen to laboratory may seriously affect results.
CALCIUM, IONIZED	<u>DEPARTMENT:</u> Mailout

TEST NAME	REQUIREMENTS
(For BHCS/KAHC/LAFB)	<u>SPECIMEN VOLUME & TYPE:</u> 2mL serum <u>CONTAINER:</u> Serum Separator Tube <u>WARD REMARK:</u> Let clot and spin immediately with cap on. Do not open tube. Ship the unopened gel barrier tube at room temperature. Do not freeze.
CARBAMAZEPINE	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2mL serum <u>CONTAINER:</u> Red-top tube <u>WARD REMARK:</u> NO GEL TUBES ACCEPTED. Through: Collect specimen immediately before the next dose is given. Peak: Draw Peak Level 8 Hrs Post Dose.
CARBON DIOXIDE (CO2)	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top, SST, or green PST (Li Heparin)
CARCINOEMBRYONIC ANTIGEN (CEA)	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or green PST (Li Heparin)
CATECHOLAMINES, URINE	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 24 hr urine <u>CONTAINER:</u> Brown urine container with 30ml 6N HCL. <u>WARD REMARK:</u> Obtain instructions and collection container from laboratory. Container must be labeled with patient's full name, date and time collection started and date & time collection finished.
CD4	See T-Subsets
CD8	See T-Subsets
CEREBROSPINAL FLUID (CSF) - COUNT & DIFFERENTIAL	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> 2ml CSF <u>CONTAINER:</u> Sterile tubes #1 & #4 <u>WARD REMARK:</u> Bring CSF tubes to hematology stat for testing. For NMCP: send CSF tube #3 to chemistry for testing. Send tube # 2 for culture; send tubes 1 & 4 to hematology unless tube order changed by provider. Tube order is always at the discretion of the provider. If less than 4 CSF tubes are received, hematology will perform counts on tubes 1 & the last tube collected.
CEREBROSPINAL FLUID (CSF) CULTURE	<u>DEPARTMENT:</u> Microbiology <u>SPECIMEN VOLUME & TYPE:</u> 2ml CSF <u>CONTAINER:</u> Sterile tube # 2 <u>WARD REMARK:</u> Bring CSF tubes to hematology stat for testing. For NMCP: send CSF tube #3 to chemistry for testing. Send tube # 2 for culture; send tubes 1 & 4 to hematology unless tube order changed by provider. Tube order is always at the discretion of the provider.
CEREBROSPINAL FLUID (CSF) PANEL, CHEMISTRY (GLUCOSE AND PROTEIN)	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml CSF <u>CONTAINER:</u> Sterile tube # 3 <u>WARD REMARK:</u> Bring CSF tubes to hematology stat for testing. For NMCP: send CSF tube #3 to chemistry for testing. Send tube # 2 for culture; send tubes 1 & 4 to

TEST NAME	REQUIREMENTS
	hematology unless tube order changed by provider. Tube order is always at the discretion of the provider.
CEREBROSPINAL FLUID (CSF) VDRL	DEPARTMENT: Virology SPECIMEN VOLUME & TYPE: 2ml CSF CONTAINER: Sterile tube #1 WARD REMARK: Cerebrospinal fluid only - order RPR qual for all other sample types! Send to lab w/in 30 min of collection.
CEREBROSPINAL FLUID (CSF) (IgG Synthesis rate, PROTEIN)	DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 1ml CSF and 2 ml serum CONTAINER: Sterile tube and red top tube or SST WARD REMARK: This test requires both serum and CSF be sent to the lab at the same time. This profile requires a minimum of 0.5 cc CSF and a serum tube.
CEREBROSPINAL FLUID (CSF) ELECTROPHORESIS	DEPARTMENT: Special Chemistry SPECIMEN VOLUME & TYPE: 3ml CSF and 2 ml serum CONTAINER: Sterile tube and plain red or SST WARD REMARK: Collect plain red top tube for serum and send with CSF for analysis consult form must accompany this test. Immediately after specimen collection, send serum with CSF for analysis.
CERULOPLASMIN	DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 1ml serum or plasma CONTAINER: Red-top tube, SST, or green PST (Li Heparin).
CH50	DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 1ml serum CONTAINER: Red-top tube or SST.
CHLAMYDIA-CT GC PROBE	DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: Swab in Gen-Probe transport kit CONTAINER: Gen-Probe transport kit WARD REMARK: Send to lab w/in 1 hr of collection. Gen-probe collection kits are required for test.
CHLORIDE	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 2ml serum or plasma CONTAINER: Red-top tube, SST, or green PST (Li Heparin)
CHLORIDE, URINE	DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 24hr urine or 20ml random urine CONTAINER: No preservative, plastic urine container for 24 hr or sterile urine cup for random specimen WARD REMARK: Recommended collection is 24 hours whenever possible. Keep on ice or refrigerated. Please order CL24 for 24hr urine's.
CHOLESTEROL	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 2mL Serum or plasma CONTAINER: Red-top tube, SST, or green PST (Li Heparin)
CHROMOSOME ANALYSIS	DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 10ml blood CONTAINER: Green (Sodium Heparin) tube WARD REMARK: DRAWN M-TH before 1300 ONLY/KEEP AT ROOM

TEST NAME	REQUIREMENTS
	TEMP/ASAP TO LAB
CIRCULATING ANTICOAGULANT	DEPARTMENT: Special Coagulation SPECIMEN VOLUME & TYPE: 2ml plasma CONTAINER: Light blue tube (Na Citrate) WARD REMARK: CONSULT REQUIRED- schedule test with Special Coagulation
COCCIDIOIDES IMMITIS AB (CF & ID)	DEPARTMENT: Serology SPECIMEN VOLUME & TYPE: 2ml serum CONTAINER: Red-top tube or SST WARD REMARK: this test is for NMCP & FT Lee labs only
COLD AGGLUTININS	DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 2ml serum CONTAINER: Red-top tube
COMPLETE BLOOD COUNT (CBC)	DEPARTMENT: Hematology SPECIMEN VOLUME & TYPE: Specimen tube capacity, whole blood CONTAINER: Lavender (EDTA) tube
COMPREHENSIVE METABOLIC PANEL	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 2ml serum or plasma CONTAINER: Red-top tube, SST, or PST green (Li Heparin)
COOMBS TEST (DIRECT ANTIGLOBULIN TEST)	DEPARTMENT: Blood bank SPECIMEN VOLUME & TYPE: 2ml whole blood CONTAINER: Pink (K2EDTA) tube Comment: For INDIRECT Coombs, see Antibody Screen
CORD BLOOD	DEPARTMENT: Blood bank SPECIMEN VOLUME & TYPE: 2ml cord blood CONTAINER: Pink (K2EDTA) tube or lavender (EDTA) tube
CORTISOL	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 2ml serum or plasma CONTAINER: Red-top tube, SST, or PST green (Li Heparin)
CPK-MB	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 2ml plasma, no turbid specimens CONTAINER: Green PST (Li Heparin) only
CREATINE KINASE (CK, CPK)	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 2ml plasma or serum CONTAINER: Green PST (Li Heparin), SST, Red top When ordered separately, specimen can be plasma or serum When ordered with CKMB panel, must be green PST(plasma)
CREATININE	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 2ml serum or plasma CONTAINER: Red-top tube, SST, or green PST (Li Heparin)
CREATININE, URINE	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 10 ml Urine for random or 24hr urine container. CONTAINER: Urine Cup for random or brown plastic urine

TEST NAME	REQUIREMENTS
	container for 24 hour. <u>WARD REMARK:</u> Obtain 24 hr collection container from laboratory services. No preservative needed. Keep on ice or refrigerated. 24 hour specimens not processed stat.
CREATININE CLEARANCE	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 24hr Urine <u>CONTAINER:</u> Brown plastic 24 hr urine container <u>WARD REMARK:</u> Serum Creatinine needed either 24 hour before or after urine collection. Obtain 24 hr urine collection container from laboratory services. No preservative needed. Keep on ice or refrigerated.
CROSSMATCH (Compatibility test)	See Type and Cross
CRP or High Sensitive CRP (C-REACTIVE PROTEIN HIGH)	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or green PST (Li Heparin)
CRYOFIBRINOGENS	<u>DEPARTMENT:</u> Special Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 7ml plasma <u>CONTAINER:</u> Green (NA heparin or PST Li heparin) tube <u>WARD REMARK:</u> Must be kept at 37°C immediately after collection, collect at NMCP only
CRYOGLOBULIN SCREEN	<u>DEPARTMENT:</u> Special Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 10ml serum <u>CONTAINER:</u> Red-top tube or SST <u>WARD REMARK:</u> Must be kept at 37°C immediately after collection, collect at NMCP only
CRYOFIBRINOGENS /CRYOGLOBULIN-QUANT	<u>DEPARTMENT:</u> Special Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 7 ml plasma and 10 ml serum <u>CONTAINER:</u> Green (NA heparin or PST Li heparin) and red-top tube <u>WARD REMARK:</u> Full 7 ml green and full 10 ml red top required. Call special chemistry before drawing. Test has 72 hour incubation time. Must be kept at 37°C immediately after collection, collect at NMCP Only
CRYOPTOCOCCUS ANTIGEN	<u>DEPARTMENT:</u> Serology <u>SPECIMEN VOLUME & TYPE:</u> 5ml serum or 2ml CSF <u>CONTAINER:</u> Red-top tube or SST for serum or sterile tube for CSF. <u>WARD REMARK:</u> bring specimen to lab within 1 hour of collection
D-DIMER	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> specimen tube capacity, plasma <u>CONTAINER:</u> Light blue (Na Citrate) tube
DESIPRAMINE	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube <u>WARD REMARK:</u> NO GEL TUBE ACCEPTED
DHEA SO4	<u>DEPARTMENT:</u> Mail out

TEST NAME	REQUIREMENTS
	<u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST <u>WARD REMARK:</u> no isotopes administered 24 hours prior to venipuncture.
DIFFERENTIAL SMEAR	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> specimen tube capacity, whole blood <u>CONTAINER:</u> Lavender (EDTA) tube
DIGOXIN	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red -top tube, plain <u>WARD REMARK:</u> NO GEL TUBES ACCEPTED. Draw specimen 6 hours AFTER dose is given, preferably 12-24 hrs after dose.
DIRECT ANTIGLOBULIN TEST (DAT) Coombs	<u>DEPARTMENT:</u> Blood bank <u>SPECIMEN VOLUME & TYPE:</u> 2ml whole blood <u>CONTAINER:</u> Pink (K2EDTA) tube
DRUG SCREEN, SERUM AFIP Legal	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 7ml serum <u>CONTAINER:</u> Red-top tube or SST <u>WARD REMARKS:</u> For aircraft mishap/competency for duty only...require AFIP Form 1323 chain of custody form
DRUG SCREEN, URINE-AFIP	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 10ml urine, clean catch <u>CONTAINER:</u> Urine cup <u>WARD REMARKS:</u> For aircraft mishap/competency for duty only...require AFIP Form 1323 chain of custody form
D-XYLOSE	Contact lab to acquire D-Xylose and schedule test
ELECTROLYTES	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum, plasma or 10 ml Urine <u>CONTAINER:</u> Red-top tube or SST, green PST (Li Heparin) or sterile urine cup
EOSINOPHIL, TOTAL & ABSOLUTE COUNT	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> specimen tube capacity, whole blood <u>CONTAINER:</u> Lavender (EDTA) tube
EOSINOPHIL, NASAL SMEAR,	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> slide nasal smear <u>CONTAINER:</u> Smear
EOSINOPHIL, URINE	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> 10 ml urine <u>CONTAINER:</u> Urine Cup
ERYTHROPOIETIN	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST
EPSTEIN BARR VIRUS AB PROFILE (EBV AB)	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST
ESR, Westergreen	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> Specimen tube capacity, whole

TEST NAME	REQUIREMENTS
	blood CONTAINER: Lavender (EDTA) tube
ESTRADIOL	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 2ml serum or plasma CONTAINER: Red-top tube, SST, or PST green (Lithium Heparin)
ESTROGEN	DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 2ml serum CONTAINER: Red-top tube or SST
ETHOSUXIMIDE (ZAROTIN)	DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 2ml serum CONTAINER: Red-top tube WARD REMARK: Oral peak draw 2-4 hrs after dose; trough immediately prior to next dose.
ETOH (ETHYL ALCOHOL)	For medical: see alcohol-medical For Legal: not performed by NMCP or BHCs.
EXPANDED STATE METABOLIC SCRIN (NEWBORN SCREEN)	DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 6 whole blood circles attached to Virginia state department Newborn Screen. CONTAINER: PKU Filter Paper-state Lab Form WARD REMARK: Contact lab for forms CHECK EXPIRATION DATE ON PKU FILTER PAPER BEFORE USE!! BABY MUST BE LESS THAN 6 MONTHS for this test.
FACTOR II	DEPARTMENT: Special Coagulation SPECIMEN VOLUME & TYPE: Specimen tube capacity, whole blood CONTAINER: 4 Light blue (Na Citrate) tubes WARD REMARK: this is not factor II mutation - order F II MUT for that test! CBC, PT, PTT, and Fibrinogen must be ordered with this test. 4 blue tops.
FACTOR VII	DEPARTMENT: Special Coagulation SPECIMEN VOLUME & TYPE: Specimen tube capacity, whole blood CONTAINER: 4 Light blue (Na Citrate) tubes WARD REMARK: CBC, PT, PTT, and Fibrinogen must be ordered with this test. 4 blue tops.
FACTOR VIII	DEPARTMENT: Special Coagulation SPECIMEN VOLUME & TYPE: Specimen tube capacity, whole blood CONTAINER: 4 Light blue (Na Citrate) tubes WARD REMARK: CBC, PT, PTT, and Fibrinogen must be ordered with this test. 4 blue tops.
FACTOR IX	DEPARTMENT: Special Coagulation SPECIMEN VOLUME & TYPE: Specimen tube capacity, whole blood CONTAINER: 4 Light blue (Na Citrate) tubes WARD REMARK: CBC, PT, PTT, and Fibrinogen must be ordered with this test. 4 blue tops.
FACTOR X	DEPARTMENT: Special Coagulation SPECIMEN VOLUME & TYPE: Specimen tube capacity, whole blood

TEST NAME	REQUIREMENTS
	<p>CONTAINER: 4 Light blue (Na Citrate) tubes WARD REMARK: CBC, PT, PTT, and Fibrinogen must be ordered with this test. 4 blue tops.</p>
<p>FACTOR XI</p>	<p>DEPARTMENT: Special Coagulation SPECIMEN VOLUME & TYPE: Specimen tube capacity, whole blood CONTAINER: 4 Light blue (Na Citrate) tubes WARD REMARK: CBC, PT, PTT, and Fibrinogen must be ordered with this test. 4 blue tops.</p>
<p>FACTOR XII</p>	<p>DEPARTMENT: Special Coagulation SPECIMEN VOLUME & TYPE: Specimen tube capacity, whole blood CONTAINER: Light blue (Na Citrate) tubes WARD REMARK: Consult required- schedule test with Special Coagulation.</p>
<p>FACTOR XIII</p>	<p>DEPARTMENT: Special Coagulation SPECIMEN VOLUME & TYPE: Specimen tube capacity, whole blood CONTAINER: Light blue (Na Citrate) tubes WARD REMARK: Consult required- schedule test with Special Coagulation.</p>
<p>FBS (FASTING BLOOD SUGAR)</p>	<p>See Glucose</p>
<p>FDP (FIBRIN DEGRADATION PRODUCTS)</p>	<p>See D-Dimer</p>
<p>FECAL FAT, QUAL</p>	<p>DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 1 gram stool CONTAINER: plastic screw-cap vial WARD REMARK: 1. Patient should be on a diet containing at least 60g of fat. 2. DO NOT use suppositories or mineral oil before collection 3. DO NOT use Oily material (creams, lubricants, etc.) Prior to or during Collection. Obtain instructions and collection container from laboratory.</p>
<p>FECAL FAT, QUANT</p>	<p>DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 72hrs stool CONTAINER: Stool collection kits WARD REMARK: Obtain instructions and collection container from laboratory.</p>
<p>FECAL LEUKOCYTES SMEAR</p>	<p>DEPARTMENT: Microbiology SPECIMEN VOLUME & TYPE: 1 gram stool CONTAINER: Plastic screw-cap vial WARD REMARK: Send to lab w/in 4hrs of collection</p>
<p>FERRITIN</p>	<p>DEPARTMENT: Special Chemistry SPECIMEN VOLUME & TYPE: 2ml serum CONTAINER: Plain red tube or SST</p>
<p>FETAL BLEED SCREEN TEST</p>	<p>DEPARTMENT: Blood bank SPECIMEN VOLUME & TYPE: 2ml whole blood CONTAINER: Pink (K₂EDTA) tube</p>

TEST NAME	REQUIREMENTS
	<u>Comment: Can only be performed on Rh negative patients</u>
FETAL HEMOGLOBIN-KLEIHAUER BETKE	<u>DEPARTMENT:</u> Blood bank <u>SPECIMEN VOLUME & TYPE:</u> 2ml whole blood <u>CONTAINER:</u> Pink (K ₂ EDTA) or Lavender (EDTA) tube <u>Comment: Submit an SF-513 consult</u>
FIBRINOGEN, IMMUNOLOGIC	<u>DEPARTMENT:</u> Special Coagulation <u>SPECIMEN VOLUME & TYPE:</u> Specimen tube capacity, plasma <u>CONTAINER:</u> Light blue (Na Citrate) tube <u>WARD REMARK:</u> Consult required- schedule test with Special Coagulation.
FIBRINOGEN, FUNCTIONAL	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> Specimen tube capacity, plasma <u>CONTAINER:</u> Light blue (Na Citrate) tube
FOLATE	<u>DEPARTMENT:</u> Special Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Plain red tube or SST <u>WARD REMARK:</u> WRAP THE SPECIMEN IN ALUMINUM FOIL TO PROTECT IT FROM LIGHT!
FREE ERYTHROCYTE PROTOPORPHYRIN	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 7ml whole blood <u>CONTAINER:</u> Lavender (EDTA) tube
Free Triiodothyronine (FREE T3)	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST
FREE THYROXINE (T4 FREE)	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST
FOLLICLE STIMULATING HORMONE (FSH)	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or green PST (Li Heparin)
FTA-ABS	<u>DEPARTMENT:</u> Serology <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST
FUNGAL ANTIBODY PANEL	<u>DEPARTMENT:</u> Serology <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST <u>WARD REMARK:</u> FID-NMCP or FID-KAHC tests for presence of ASPERGILLUS Ab, Blastomyces Ab, Coccidioides Ab, Candida Ab, and Histoplasma Ab by IMMUNO-DIFFUSION.
G6PD	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> 2ml whole blood <u>CONTAINER:</u> Yellow (ACD) tube or Lavender (EDTA) tube
GAMMA GLUTAMYL TRANSFERASE (GGT)	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or green PST (Li Heparin)
GASTRIN	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST <u>WARD REMARK:</u> PT must be fasting. Collect on ice and send

TEST NAME	REQUIREMENTS
	to lab immediately.
GENTAMICIN	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Plain red <u>WARD REMARK:</u> No gel tubes accepted. Pharmacology (dosage & time) sheet required. Peak specimens should be drawn 1 hr after initiation of 30 minute infusion or 30 minutes after longer infusions. Trough specimens should be drawn immediately prior to the next dose.
GLUCOSE, CSF	See CSF Panel, chemistry
GLUCOSE	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, green PST (Li Heparin), or gray (K oxalate)
GLUCOSE, URINE	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 10 ml urine for random or 24hr urine container with 5ml Glacial acetic acid. <u>CONTAINER:</u> Urine cup for random or brown plastic urine container for 24 hour. <u>WARD REMARK:</u> Obtain 24 hr collection container from laboratory services. Keep on ice or refrigerated. 24 hour specimens not processed stat.
GLUCOSE TOLERANCE TEST 3 HR GTT 5 HR GTT 1 H PG-50G 1 H PT-75G 2 H PP 2 H PT-75G	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> For BHCs: Red-top tube or SST For NMCP: Gray tube <u>WARD REMARK:</u> 1 HR and 2HR, no scheduling required. Patient must be present prior to 0800. 3HR and 5HR need appointment
GLYCOSYLATED HEMOGLOBIN	See Hemoglobin A1C
GROWTH HORMONE (HGH)	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST
HAPTOGLOBIN	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or green PST (Li Heparin)
HCG	See Human Chorionic Gonadotropin
HDL CHOLESTEROL	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or green PST (Li Heparin)
HEAVY METALS, SCREEN	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 7ml urine <u>CONTAINER:</u> Urine cup <u>WARD REMARK:</u> No seafood or red wine for 72hrs prior to collection. Acquire a metal-free container from lab

TEST NAME	REQUIREMENTS
	prior to collection.
HELPER CELLS (CD4)	See T-Subsets
HELPER/SUPPRESSOR RATIO	See T-Subsets
HEMATOCRIT, MANUAL (SPUN)	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> Specimen tube capacity, whole blood <u>CONTAINER:</u> Lavender (EDTA) tube
HEMOGLOBIN	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> Specimen tube capacity, whole blood <u>CONTAINER:</u> Lavender (EDTA) tube
HEMOGLOBIN A1C	<u>DEPARTMENT:</u> Special Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml whole blood <u>CONTAINER:</u> Lavender (EDTA) tube
HEMOGLOBIN ELECTROPHORESIS	<u>DEPARTMENT:</u> Special Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml whole blood <u>CONTAINER:</u> Lavender (EDTA) tube <u>WARD REMARK:</u> 1. Please order a CBC and smear for RBC morphology with this test 2. Hemoglobin electrophoresis/HPLC requires a CBC and smear for RBC morphology to accurately result interpretation
HEMOGLOBIN-H (Hemoglobin Electrophoresis)	<u>DEPARTMENT:</u> Special Chemistry <u>SPECIMEN VOLUME & TYPE:</u> specimen tube capacity, whole blood <u>CONTAINER:</u> Lavender (EDTA) tube <u>WARD REMARK:</u> CBC needed. Order Hemoglobin electrophoresis.
HEMOGRAM	See Complete Blood Count (CBC)
HEPATIC FUNCTION PANEL	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or PST green (Li Heparin)
HEPATITIS A-IGM	<u>DEPARTMENT:</u> Special Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST
HEPATITIS A Total Antibody (IgG and IgM)	<u>DEPARTMENT:</u> Special Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST
HEPATITIS B CORE AB (IGM)	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 7ml serum <u>CONTAINER:</u> Red-top tube or SST
HEPATITIS B "e" ANTIBODY	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 7ml serum <u>CONTAINER:</u> Red-top tube or SST <u>WARD REMARK:</u> Bring to lab within 4 hrs of collection

TEST NAME	REQUIREMENTS
HEPATITIS B "e" ANTIGEN	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 7ml serum <u>CONTAINER:</u> Red-top tube or SST
HEPATITIS CORE ANTIBODY (TOTAL)	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 7ml serum <u>CONTAINER:</u> Red-top tube or SST
HEPATITIS B SURFACE ANTIBODY	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 7ml serum <u>CONTAINER:</u> Red-top tube or SST
HEPATITIS B SURFACE ANTIGEN	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 7ml serum <u>CONTAINER:</u> Red-top tube or SST
HEPATITIS C ANTIBODY (HCV)	<u>DEPARTMENT:</u> Special Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 7ml Serum <u>CONTAINER:</u> Red-top tube or SST
HGB & HCT (H&H)	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> Specimen tube capacity, whole blood <u>CONTAINER:</u> Lavender (EDTA) tube
HIV (RAPID) (NEEDLE STICK ONLY)	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> Specimen tube capacity, whole blood <u>CONTAINER:</u> Lavender (EDTA) tube <u>WARD REMARK:</u> This test is for Needlestick protocol on the patient who is the source, the employee who was stuck, Labor and delivery mother, active duty receiving smallpox vaccine, or child with HIV positive mother.
HLA B-27	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 7 ml whole blood (2 tubes) <u>CONTAINER:</u> Yellow ACD tubes or Lavender (EDTA tubes) <u>WARD REMARK:</u> Draw 2 7ml yellow or lavender tubes
HUMAN CHORIONIC GONADOTROPIN (HCG) QUAL, SERUM	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST
HCG, QUAL, URINE	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> 10 ml urine <u>CONTAINER:</u> Urine cup <u>WARD REMARK:</u> Specimen of choice is 1 st morning void
HCG, QUANT, TOTAL,	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST tube, PST Green <u>WARD REMARK:</u> Not for testing males, order HCG, beta subunit. This HCG test can not be used for serial monitoring
HCG BETA SUBUNIT	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST <u>WARD REMARK:</u> For male only or female IVF only.
IMMUNOGLOBULIN QUANT PANEL	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 7ml serum or plasma

TEST NAME	REQUIREMENTS
(IGG, IGA, IGM)	<u>CONTAINER:</u> Red-top tube, SST, or green PST (Li Heparin)
IMMUNOGLOBULIN IGE	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST
IMIPRAMINE+DESIPRAMINE (TOFRANIL)	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Plain red <u>WARD REMARK:</u> No gel tubes accepted.
IMMUNOPHENOTYPING FOR LEUKEMIA AND LYMPHOMA (CYTOLOGIC NON-GYN)	<u>DEPARTMENT:</u> Flow Cytometry <u>SPECIMEN VOLUME & TYPE:</u> Specify specimen type (lymph node, bone marrow [Na heparin tube], peripheral blood [EDTA & Na Heparin tubes], fine needle aspirate...) <u>CONTAINER:</u> Lavender and green tubes for Peripheral blood Green tube for bone marrow Lymph node in RPMI <u>WARD REMARK:</u> Consult needed
INDIRECT COOMBS	<u>See Antibody Screen</u>
INSULIN	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST <u>WARD REMARK:</u> Fasting specimen preferable.
IRON (FE)	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml Serum <u>CONTAINER:</u> Red-top tube only
IRON BINDING CAPACITY (TIBC)	See Total Iron Binding Capacity (TIBC)
KETONES, SERUM	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST <u>WARD REMARK:</u> Provider must specify if dilution of positive specimen is required
KETONES, URINE	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> 1ml urine <u>CONTAINER:</u> urine cup
KLEIHAUER-BETKE (FETAL HEMOGLOBIN)	<u>DEPARTMENT:</u> Blood bank <u>SPECIMEN VOLUME & TYPE:</u> 2ml whole blood <u>CONTAINER:</u> Pink (K ₂ EDTA) or Lavender (EDTA) tube <u>Comment:</u> Submit SF-513 consult
LACTIC ACID	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml plasma <u>CONTAINER:</u> Gray tube (Na fluoride/K oxalate) <u>WARD REMARK:</u> place sample in ice. Transport to lab immediately for specimen processing transporting delay may cause inaccurate results.
LDH (LACTATE DEHYDROGENASE)	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or green PST (Li Heparin)

TEST NAME	REQUIREMENTS
LEAD	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 7ml whole blood <u>CONTAINER:</u> Lavender (EDTA) tube
LEUKOCYTE ALKALINE PHOSPHATASE (LAP)	<u>DEPARTMENT:</u> Special Coagulation <u>SPECIMEN VOLUME & TYPE:</u> Specimen tube capacity, plasma <u>CONTAINER:</u> Green (Na Heparin) tube <u>WARD REMARK:</u> Schedule test with special coagulation and protect from light.
LIPASE	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red -top tube, SST, or green PST (Li Heparin)
LITHIUM	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Plain red <u>WARD REMARK:</u> No gel tubes accepted. Collect specimen 12 hours after dose.
LIVER FUNCTION TEST	See Hepatic Function test
LUPUS ANTICOAGULANT	<u>DEPARTMENT:</u> Special Coagulation <u>SPECIMEN VOLUME & TYPE:</u> Specimen tube capacity, plasma <u>CONTAINER:</u> Light blue (Na Citrate) tube <u>WARD REMARK:</u> Collect 4 blue top tubes; place samples in ice & bring to NMCP lab receiving within 30 minutes of collection!
LYMPH MARKERS	See T-Subsets
MAGNESIUM	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or green PST (Li Heparin)
MAGNESIUM, URINE	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 10 ml urine for random or 24hr urine container. <u>CONTAINER:</u> Urine cup for random or brown plastic urine container for 24 hour. <u>WARD REMARK:</u> Obtain 24 hr collection container from laboratory services. No preservative needed. Keep on ice or refrigerated. 24 hour specimens not processed stat.
MALARIA/BLOOD PARASITE EXAM	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> Specimen tube capacity, whole blood <u>CONTAINER:</u> Lavender (EDTA) tube <u>WARD REMARK:</u> Bring specimen to NMCP Specimen Processing within 30 minutes of collection. At Naval BMC & remote laboratories that refer to NMCP for testing, prepare 3 unstained peripheral blood smears (like differential) and 3 unstained slides with a thick drop in the center.

TEST NAME	REQUIREMENTS
METANEPHRINES	<p>DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 24 hr urine CONTAINER: Brown urine container with 30ml 6N HCL. WARD REMARK: Obtain instructions and collection container from laboratory. Container must be labeled with patient's full name, date and time collection started and date & time collection finished. No caffeine before or during collection. Monamine oxidase inhibitors should be discontinued at least 1 week prior to beginning collection.</p>
METHOTREXATE	<p>DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 2ml serum CONTAINER: Plain red WARD REMARK: No gel tubes accepted. Protect from light</p>
Microalbumin/ Creatinine Ratio	<p>DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 1ml of random urine CONTAINER: Urine cup</p>
Microalbumin	<p>DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: Random urine CONTAINER: Urine cup for random, 24 hour for mailout.</p>
MONONUCLEOSIS SCREEN (MONOSPOT)	<p>DEPARTMENT: Hematology SPECIMEN VOLUME & TYPE: 7ml serum or plasma CONTAINER: Lavender (EDTA) tube or red-top tube or SST</p>
MUMPS TITER	<p>DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 2ml serum CONTAINER: Red-top tube or SST</p>
MYOGLOBIN, BLOOD	<p>DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 2ml plasma CONTAINER: Green PST (Li Heparin) only</p>
MYOGLOBIN QUAL, URINE	<p>DEPARTMENT: Special Chemistry SPECIMEN VOLUME & TYPE: 10 ml urine, clean catch CONTAINER: Urine Cup</p>
MYOGLOBIN QUANT, URINE	<p>DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 7ml urine CONTAINER: Urine cup</p>
NASAL EOSINOPHIL	See Eosinophil, Nasal
NEWBORN SCREEN	See EXPANDED STATE METABOLIC SCRNM
OB SCREEN (PRENATAL SCREEN)	<p>DEPARTMENT: Blood bank SPECIMEN VOLUME & TYPE: 6ml whole blood CONTAINER: Pink (K₂EDTA) tube Comment: Includes ABO-Rh and antibody screen, with antibody identification and titer, if applicable.</p>
OSMOLALITY, SERUM	<p>DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 2ml serum CONTAINER: Red-top tube or SST</p>

TEST NAME	REQUIREMENTS
OSMOLALITY, URINE	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 4ml urine, clean catch. <u>CONTAINER:</u> Urine cup
PARTIAL THROMBOPLASTIN TIME-ACTIVATED (APTT)	See APTT
PHENOBARBITAL	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Plain red <u>WARD REMARK:</u> No gel tubes accepted. Collect specimen immediately before the next dose is given or at least 1HR after I.V. infusion is complete.
PHOSPHOROUS	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or green PST (Li Heparin)
PHOSPHOROUS, URINE	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 10 ml urine for random or 24hr urine container. <u>CONTAINER:</u> Urine cup for random or brown plastic urine container for 24 hour. <u>WARD REMARK:</u> Obtain 24 hr collection container from laboratory services. No preservative needed. Keep on ice or refrigerated. 24 hour specimens not processed stat.
PLATELET AGGREGATION	<u>DEPARTMENT:</u> Special Coagulation <u>SPECIMEN VOLUME & TYPE:</u> Call Special Coagulation for Information and appointment.
PLATELET ANTIBODY CIRCULATING	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Plain red <u>WARD REMARK:</u> No gel tubes accepted.
PLATELET ASSOCIATED IGG	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 14 ml whole blood <u>CONTAINER:</u> 2 yellow (ACD) tubes <u>WARD REMARK:</u> Tubes must be signed, with date and time of collection. Test can only be drawn Mon, Tues, and Wed before 1300. Test can only be drawn at NMCP, FEVA, Boone, Oceana or Sewells pt.
PLATELET ANTIBODY PANEL	See Platelet Antibody circulating or Platelet Associated IGG
PLATELET COUNT	<u>DEPARTMENT:</u> Hematology <u>SPECIMEN VOLUME & TYPE:</u> Specimen tube capacity, whole blood <u>CONTAINER:</u> Lavender (EDTA) tube
POTASSIUM	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma <u>CONTAINER:</u> Red-top tube, SST, or green PST (Li Heparin)
POTASSIUM, URINE	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 10 ml urine for random or 24hr urine container.

TEST NAME	REQUIREMENTS
	<p>CONTAINER: Urine cup for random or brown plastic urine container for 24 hour.</p> <p>WARD REMARK: Obtain 24 hr collection container from laboratory services. No preservative needed. Keep on ice or refrigerated. 24 hour specimens not processed stat.</p>
PREALBUMIN	<p>DEPARTMENT: Chemistry</p> <p>SPECIMEN VOLUME & TYPE: 2ml serum or plasma</p> <p>CONTAINER: Red-top tube, SST, or green PST (Li Heparin)</p>
PRENATAL SCREEN (OB SCREEN)	<p>DEPARTMENT: Blood bank</p> <p>SPECIMEN VOLUME & TYPE: 6ml whole blood</p> <p>CONTAINER: Pink (K₂EDTA) tube</p> <p>Comment: Includes ABO-Rh and antibody screen, with antibody identification and titer, if applicable.</p>
PRIMIDONE	<p>DEPARTMENT: Mail out</p> <p>SPECIMEN VOLUME & TYPE: 2ml serum</p> <p>CONTAINER: Plain red</p> <p>WARD REMARK: no gel tubes accepted.</p>
PROCAINAMIDE (NAPA/PROCAINAMIDE)	<p>DEPARTMENT: Mail out</p> <p>SPECIMEN VOLUME & TYPE: 2ml serum</p> <p>CONTAINER: Plain red</p> <p>WARD REMARK: No gel tubes accepted.</p>
PROGESTERONE	<p>DEPARTMENT: Chemistry</p> <p>SPECIMEN VOLUME & TYPE: 2ml serum or plasma</p> <p>CONTAINER: Red-top tube, SST, or PST green (Li Heparin)</p> <p>WARD REMARK: Test performed at NMCP Chemistry daily.</p>
PROLACTIN	<p>DEPARTMENT: Chemistry</p> <p>SPECIMEN VOLUME & TYPE: 2ml serum or plasma</p> <p>CONTAINER: Red-top tube, SST, or PST green (Li Heparin)</p> <p>WARD REMARK: Transport to Lab immediately, do not use turbid specimens</p>
PROTAMINE SULFATE	<p>DEPARTMENT: Special Coagulation</p> <p>SPECIMEN VOLUME & TYPE: specimen tube capacity, plasma</p> <p>CONTAINER: light blue (Na Citrate) tube</p> <p>WARD REMARK: Consult required- schedule test with special coagulation.</p>
PROTEIN ELECTROPHORESIS, CSF	<p>See Cerebrospinal Fluid, Electrophoresis</p>
PROTEIN ELECTROPHORESIS, SERUM	<p>DEPARTMENT: Special Chemistry</p> <p>SPECIMEN VOLUME & TYPE: 7ml serum</p> <p>CONTAINER: Red-top tube or SST</p> <p>WARD REMARK: Consult form required</p>
PROTEIN ELECTROPHORESIS, URINE	<p>DEPARTMENT: Special Chemistry</p> <p>SPECIMEN VOLUME & TYPE: 10ml of 24hr urine only</p> <p>CONTAINER: Brown plastic urine container for 24 hour.</p>
PROTEIN, TOTAL	<p>DEPARTMENT: Chemistry</p> <p>SPECIMEN VOLUME & TYPE: 2ml serum or plasma</p> <p>CONTAINER: Red-top tube, SST, or green PST (Li Heparin)</p>

TEST NAME	REQUIREMENTS
PROTEIN, TOTAL URINE	<p>DEPARTMENT: Chemistry</p> <p>SPECIMEN VOLUME & TYPE: 10 ml urine for random or 24hr urine container.</p> <p>CONTAINER: Urine cup for random or brown plastic urine container for 24 hour.</p> <p>WARD REMARK: Obtain 24 hr collection container from laboratory services. No preservative needed. Keep on ice or refrigerated. 24 hour specimens not processed stat.</p>
PROTEIN C (IMMUNOLOGIC)	<p>DEPARTMENT: Special Coagulation</p> <p>SPECIMEN VOLUME & TYPE: Specimen tube capacity, plasma</p> <p>CONTAINER: Light blue (Na Citrate) tube</p> <p>WARD REMARK: No anticoagulant meds for 2 weeks prior to this test</p>
PROTHROMBIN TIME (PT)	<p>DEPARTMENT: Hematology</p> <p>SPECIMEN VOLUME & TYPE: Specimen tube capacity, plasma</p> <p>CONTAINER: Light Blue (Sodium Citrate) tube</p> <p>WARD REMARK: FULL TUBE REQUIRED</p>
PSEUDOKHOLINEST-ERASE	<p>DEPARTMENT: Mail out</p> <p>SPECIMEN VOLUME & TYPE: 2ml serum</p> <p>CONTAINER: Red-top tube or SST</p>
PTH, INTACT	<p>DEPARTMENT: Mail out</p> <p>SPECIMEN VOLUME & TYPE: 2ml serum</p> <p>CONTAINER: Red-top tube or SST</p>
PTH, INTRAOPERATIVE PANEL	<p>DEPARTMENT: Special Chemistry</p> <p>SPECIMEN VOLUME & TYPE: 4 ml plasma</p> <p>CONTAINER: Lavender tube (EDTA)</p> <p>WARD REMARK: For lab use only - lab will order, pickup for surgical parathyroid removal, and result at end of procedure. Must be scheduled through Special Chemistry</p>
QUINIDINE	<p>DEPARTMENT: Mail out</p> <p>SPECIMEN VOLUME & TYPE: 2ml serum</p> <p>CONTAINER: Plain red</p> <p>WARD REMARK: No gel tubes accepted. Recommended draw time is just prior to next dose.</p>
RBC MORPHOLOGY	<p>DEPARTMENT: Hematology</p> <p>SPECIMEN VOLUME & TYPE: Specimen tube capacity, whole blood</p> <p>CONTAINER: Lavender (EDTA) tube</p>
RENAL FUNCTION PANEL	<p>DEPARTMENT: Chemistry</p> <p>SPECIMEN VOLUME & TYPE: 2ml serum or plasma</p> <p>CONTAINER: Red-top tube, SST, or PST green (Li Heparin)</p>
RETICULOCYTES	<p>DEPARTMENT: Hematology</p> <p>SPECIMEN VOLUME & TYPE: Specimen tube capacity, whole blood</p> <p>CONTAINER: Lavender (EDTA) tube</p>
RHEUMATOID FACTOR (RA) SCREEN & QUANT	<p>DEPARTMENT: Chemistry</p> <p>SPECIMEN VOLUME & TYPE: 2ml serum or plasma</p> <p>CONTAINER: Red -top tube, SST, or green PST (Li Heparin)</p>
RICKETTSIA AB	<p>DEPARTMENT: Mail out</p>

TEST NAME	REQUIREMENTS
PROFILE	<u>SPECIMEN VOLUME & TYPE</u> : 2ml serum <u>CONTAINER</u> : Red-top tube or SST
RISTOCETIN COFACTOR ASSAY	<u>DEPARTMENT</u> : Special Coagulation <u>SPECIMEN VOLUME & TYPE</u> : Specimen tube capacity, whole blood <u>CONTAINER</u> : 4 Light blue (Na Citrate) tubes <u>WARD REMARK</u> : CBC, PT, PTT, and Fibrinogen must be ordered with this test. 4 blue tops.
ROUTINE URINALYSIS	See Urinalysis
RPR-QUAL	<u>DEPARTMENT</u> : Serology <u>SPECIMEN VOLUME & TYPE</u> : 2ml serum <u>CONTAINER</u> : Plain red <u>WARD REMARK</u> : Send to lab w/in 4 hrs of collection. Specimen is heat labile.
RPR-QUANT	<u>DEPARTMENT</u> : Serology <u>SPECIMEN VOLUME & TYPE</u> : 2ml serum <u>CONTAINER</u> : Plain red <u>WARD REMARK</u> : Send to lab w/in 4 hrs of collection. Specimen is heat labile.
RUBELLA VIRUS IGG, QUAL	<u>DEPARTMENT</u> : Special Chemistry <u>SPECIMEN VOLUME & TYPE</u> : 2ml serum <u>CONTAINER</u> : Red-top tube or SST
RUBEOLA (MEASLES)	<u>DEPARTMENT</u> : Mail out <u>SPECIMEN VOLUME & TYPE</u> : 2ml serum <u>CONTAINER</u> : Red-top tube or SST
SALICYLATES	<u>DEPARTMENT</u> : Chemistry <u>SPECIMEN VOLUME & TYPE</u> : 2ml serum <u>CONTAINER</u> : Plain red <u>WARD REMARK</u> : No gel tubes accepted.
SCHLICHTER TEST	<u>DEPARTMENT</u> : Microbiology <u>SPECIMEN VOLUME & TYPE</u> : 2ml serum <u>CONTAINER</u> : Red-top tube or SST <u>WARD REMARK</u> : Indicate the organism needing the serum bactericidal titer; send specimen to lab w/in 30 minutes of collection
SEDIMENTATION RATE (WESTERGREEN)	See ESR
SGOT/AST	See Aspartate Aminotransferase
SGPT/ALT	See Alanine Aminotransferase
SICKLE CELL SCREEN	<u>DEPARTMENT</u> : Hematology <u>SPECIMEN VOLUME & TYPE</u> : Specimen tube capacity, whole blood <u>CONTAINER</u> : Lavender (EDTA) tube
SODIUM, SERUM	<u>DEPARTMENT</u> : Chemistry <u>SPECIMEN VOLUME & TYPE</u> : 2ml serum or plasma <u>CONTAINER</u> : Red-top tube, SST, or green PST (Li Heparin)
SODIUM, URINE	<u>DEPARTMENT</u> : Chemistry

TEST NAME	REQUIREMENTS
	<p><u>SPECIMEN VOLUME & TYPE:</u> 10 ml urine for random or 24hr urine container.</p> <p><u>CONTAINER:</u> Urine cup for random or brown plastic urine container for 24 hour.</p> <p><u>WARD REMARK:</u> Obtain 24 hr collection container from laboratory services. No preservative needed. Keep on ice or refrigerated. 24 hour specimens not processed stat.</p>
STREPTOZYME SCREEN	<p><u>DEPARTMENT:</u> Serology</p> <p><u>SPECIMEN VOLUME & TYPE:</u> 2ml serum</p> <p><u>CONTAINER:</u> Red-top tube or SST</p> <p><u>WARD REMARK:</u> indicate the organism needing the serum bactericidal titer; send specimen to lab w/in 30 minutes of collection</p>
SUPPRESSOR CELLS CD8	<p>See T-Subsets</p>
SYNOVIAL FLUID COUNT	<p><u>DEPARTMENT:</u> Hematology</p> <p><u>SPECIMEN VOLUME & TYPE:</u> 3ml Synovial fluid</p> <p><u>CONTAINER:</u> Lavender (EDTA) tube</p>
T-SUBSETS (FLOWPNL)	<p><u>DEPARTMENT:</u> Flow Cytometry</p> <p><u>SPECIMEN VOLUME & TYPE:</u> 7ml whole blood</p> <p><u>CONTAINER:</u> 1 lavender (EDTA) & 1 green (Na Heparin) tubes</p>
T3 TRIIODOTHYRONINE	<p><u>DEPARTMENT:</u> Chemistry</p> <p><u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma</p> <p><u>CONTAINER:</u> Red-top tube or SST or green PST</p> <p><u>WARD REMARK:</u> Bring to lab within 1 hour of collection for specimen processing.</p>
T3 UPTAKE	<p>See Thyroid panel</p>
T4 THYROXINE	<p><u>DEPARTMENT:</u> Chemistry</p> <p><u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma</p> <p><u>CONTAINER:</u> Red-top tube or SST or green PST</p>
T7 (FT4)	<p>See Thyroid panel</p>
THYROID PANEL	<p><u>DEPARTMENT:</u> Chemistry</p> <p><u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma</p> <p><u>CONTAINER:</u> Red-top tube or SST or green PST</p>
THYROXINE BINDING GLOBULIN	<p><u>DEPARTMENT:</u> Mail out</p> <p><u>SPECIMEN VOLUME & TYPE:</u> 2ml serum</p> <p><u>CONTAINER:</u> Red-top tube or SST</p>
TEGRETOL	<p>See Carbamazepine</p>
TESTOSTERONE	<p><u>DEPARTMENT:</u> Chemistry</p> <p><u>SPECIMEN VOLUME & TYPE:</u> 7ml serum or plasma</p> <p><u>CONTAINER:</u> Red-top tube, SST, PST green (Li Heparin)</p>
THEOPHYLLINE	<p><u>DEPARTMENT:</u> Chemistry</p> <p><u>SPECIMEN VOLUME & TYPE:</u> 2ml serum</p> <p><u>CONTAINER:</u> Plain red</p> <p><u>WARD REMARK:</u> No gel tubes accepted. Collect specimen immediately before next dose is given</p>
THROMBIN TIME	<p><u>DEPARTMENT:</u> Hematology</p>

TEST NAME	REQUIREMENTS
	<u>SPECIMEN VOLUME & TYPE:</u> Specimen tube capacity, plasma <u>CONTAINER:</u> Light Blue (Sodium Citrate) tube <u>WARD REMARK:</u> FULL TUBE REQUIRED
TIBC (TOTAL IRON BINDING CAPACITY)	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum only <u>CONTAINER:</u> Red-top tube or SST
TOBRAMYCIN	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Plain red <u>WARD REMARK:</u> No gel tubes accepted. Pharmacology (dosage & time) sheet required. Peak specimens should be drawn 1hr after initiation of a 30 minute infusion or 30 minutes after the completion of longer infusions. Trough specimens should be drawn immediately prior to next dose.
TORCH-PRENETAL INFECTIOUS DISEASE AB	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST
TOTAL EOSINOPHIL	See Eosinophil, total and absolute count
TOTAL PROTEIN	See Protein, total
TOXOPLASMA PANEL	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST
TRICYCLIC ANTIDEPRESSANT SCRIN, SERUM	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Plain red <u>WARD REMARK:</u> No gel tubes accepted.
TRICYCLIC ANTIDEPRESSANT SCRIN, URINE	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> At least 50ml urine <u>CONTAINER:</u> Urine cup
TSH (3 RD GENERATION ASSAY)	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2 ml serum <u>CONTAINER:</u> Red-top tube or SST
TYPE & CROSSMATCH	<u>DEPARTMENT:</u> Blood bank <u>SPECIMEN VOLUME & TYPE:</u> 6ml whole blood <u>CONTAINER:</u> Pink (K ₂ EDTA) tube <u>WARD REMARK:</u> 6530/9 REQUEST FOR BLOOD PRODUCTS is required
TYPE & RH (ABO & RH)	<u>DEPARTMENT:</u> Blood bank <u>SPECIMEN VOLUME & TYPE:</u> 6ml whole blood <u>CONTAINER:</u> Pink (K ₂ EDTA) tube
TYPE & SCREEN	<u>DEPARTMENT:</u> Blood bank <u>SPECIMEN VOLUME & TYPE:</u> 6ml whole blood <u>CONTAINER:</u> Pink (K ₂ EDTA) tube <u>WARD REMARK:</u> 6530/9 REQUEST FOR BLOOD PRODUCTS is required
URIC ACID	<u>DEPARTMENT:</u> Chemistry <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum or plasma

TEST NAME	REQUIREMENTS
	CONTAINER: Red-top tube, SST, or green PST (Li Heparin)
URIC ACID, URINE	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 10 ml urine for random or 24hr urine container CONTAINER: Urine cup for random or brown plastic urine container for 24 hour. No preservative for 24 hours WARD REMARK: Obtain 24 hr collection container from laboratory services. Keep on ice or refrigerated. 24 hour specimens not processed stat.
URINALYSIS	DEPARTMENT: Hematology SPECIMEN VOLUME & TYPE: 20ml urine, clean catch. CONTAINER: Urine cup
URINE DRUG SCREEN	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 10ml urine, clean catch. CONTAINER: Urine cup WARD REMARK: This test is for medical purposes only...no Legal chain of custody document is required! Bring to lab within 30 minutes of collection
URINE EOSINOPHIL	See Eosinophil, urine
URINE UREA NITROGEN	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 25-50ml urine for random or 24hr urine container CONTAINER: Urine cup for random or brown plastic urine container for 24 hour. WARD REMARK: Obtain 24 hr collection container from laboratory services. Keep on ice or refrigerated. 24 hour specimens not processed stat.
VALPROIC ACID	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 2ml serum CONTAINER: Plain red WARD REMARK: No gel tubes accepted. Pharmacology (dosage & time) sheet required. Peak specimens should be drawn 1 to 4hrs after dose was given. Trough specimens should be drawn immediately prior to the am dose.
VANCOMYCIN	DEPARTMENT: Chemistry SPECIMEN VOLUME & TYPE: 2ml serum CONTAINER: Plain red WARD REMARK: No gel tubes accepted.
VARICELLA ZOSTER	DEPARTMENT: Mail out SPECIMEN VOLUME & TYPE: 2ml serum CONTAINER: Red-top tube or SST
VDRL, CSF	See CEREBROSPINAL FLUID (CSF)VDRL
VDRL, SERUM	See RPR QUAL or RPR QUANT
VISCOCITY WHOLE BLOOD/SERUM	DEPARTMENT: Special Chemistry SPECIMEN VOLUME & TYPE: 7ml plasma or 7ml serum CONTAINER: Green (NA Heparin, Lithium Heparin)tube, SST or red WARD REMARK: Special chemistry must be notified before specimen is drawn

TEST NAME	REQUIREMENTS
VITAMIN D	<u>DEPARTMENT:</u> Mail out <u>SPECIMEN VOLUME & TYPE:</u> 2ml serum <u>CONTAINER:</u> Red-top tube or SST
VW COFACTOR	See Ristocetin Cofactor
WEIL FELIX	See Rickettsia Ab Profile

II. COLLECTION OF BACTERIOLOGICAL SPECIMENS

TEST NAME	REQUIREMENTS
ABSCESS (PUS)	<u>PREPARATION:</u> Clean and treat with antiseptic soap. <u>SPECIMEN VOLUME & TYPE:</u> Pus, More than 1ml <u>CONTAINER:</u> Syringe <u>TECHNIQUE:</u> Aspirate directly into syringe, remove needle. <u>INFO HELPFUL TO LAB:</u> Duration, Location
ABSCESS, DENTAL OR ROOT-	SEE ORAL CAVITY
AFB CULTURE	<u>SPECIMEN VOLUME & TYPE:</u> Specify AFB <u>CONTAINER:</u> Sterile container
BREAST MILK	<u>PREPARATION:</u> Skin decontamination of nipple and fingers <u>SPECIMEN VOLUME & TYPE:</u> 1-2 ml, Discard first ml <u>CONTAINER:</u> Sterile cup or tube <u>TECHNIQUE:</u> Sterile pump or manual expression <u>INFO HELPFUL TO LAB:</u> Suspected abscess
BODY FLUIDS - BLOOD, OTHER, JOINT	<u>PREPARATION:</u> Skin decontamination <u>SPECIMEN VOLUME & TYPE:</u> Several mls <u>CONTAINER:</u> Vacutainer, Sterile tube <u>TECHNIQUE:</u> sterile aspiration with syringe <u>INFO HELPFUL TO LAB:</u> History of trauma, previous surgery or infection, medication <u>CONTAINER:</u> Sterile cup or tube <u>TECHNIQUE:</u> Sterile pump or manual expression <u>INFO HELPFUL TO LAB:</u> Suspected abscess <u>COMMENT:</u> When in doubt, use an anticoagulant.
BLOOD CULTURES -	SEE PROCEDURE FOR COLLECTING BLOOD CULTURES
CSF	<u>PREPARATION:</u> Skin decontamination <u>SPECIMEN VOLUME & TYPE:</u> 2 ml minimum <u>CONTAINER:</u> Sterile clean screw capped tube <u>TECHNIQUE:</u> Sterile Lumbar puncture; Ventricular suboccipital tap <u>INFO HELPFUL TO LAB:</u> Tentative clinical diagnosis <u>COMMENT:</u> Pool sediment of all tubes after cell count; pool supernatant for Chemistry and Serology. <u>DO NOT REFRIGERATE.</u> MAINTAIN AT ROOM TEMPERATURE PRIOR TO CULTURE

TEST NAME	REQUIREMENTS
EAR-EXTERNAL	<p>PREPARATION: Cleanse external canal with mild soap.</p> <p>SPECIMEN VOLUME & TYPE Swab, scraping or fluid aspirate</p> <p>CONTAINER: Sterile tube, Swab with *TN.</p> <p>TECHNIQUE: Obtain specimen from active margin</p> <p>INFO HELPFUL TO LAB: Clinical suspicion</p> <p>COMMENT: Surface swabbing may miss Strep, Cellulitis or Erysipelas</p>
EAR-INTERNAL	<p>PREPARATION: Cleanse external canal with mild antiseptic soap.</p> <p>SPECIMEN VOLUME & TYPE: Swabs</p> <p>CONTAINER: Sterile clean tube, Swab with *TN</p> <p>TECHNIQUE: Collect specimen through sterile tunnel from eardrum or beyond.</p> <p>INFO HELPFUL TO LAB: History of acute or chronic Otitis Media</p> <p>COMMENT: Specimen should be collected by Provider.</p>
EYE - EXTERNAL	<p>PREPARATION: Cleanse skin around eye. Gently remove make-up and ointment with sterile cotton and saline.</p> <p>SPECIMEN VOLUME & TYPE: 2 Moistened Swabs</p> <p>CONTAINER: Moist sterile swabs and alcohol cleaned slides for Gram's stain</p> <p>TECHNIQUE: Swabbing - Pass each moistened swab 2 times over lower conjunctiva. Avoid eyelid, border, and lashes.</p> <p>INFO HELPFUL TO LAB: History, suspected problem, medication.</p>
EYE -LID, BORDER	<p>PREPARATION: Same as external</p> <p>SPECIMEN VOLUME & TYPE: Same as external</p> <p>CONTAINER: Same as external</p> <p>TECHNIQUE: Swabbing - Pass each moistened swab 2 times over eyelid border as indicated. Culture separately.</p> <p>INFO HELPFUL TO LAB: History, suspected problem</p>
FEMALE - VAGINA	<p>PREPARATION: Use speculum without lubricant</p> <p>SPECIMEN VOLUME & TYPE: Aspirate or swab, gram stain, KOH Preparation</p> <p>CONTAINER: Swab with *TN</p> <p>TECHNIQUE: Simple aspiration, swabbing; swab mucosa high in vaginal canal</p> <p>INFO HELPFUL TO LAB: History of discharge</p> <p>COMMENT: Ulcerations should be checked for Syphilis. Yeast common. Saline - Yeast. KOH - Fungal.</p>
FUNGUS CULTURE	<p>SPECIMEN VOLUME & TYPE: Specify fungus</p> <p>CONTAINER: Sterile container</p>

TEST NAME	REQUIREMENTS
INFLUENZA rRTPCR	<p>PREPARATION: None</p> <p>SPECIMEN: Nasal/Nasopharyngeal/Tracheal/Bronchoalveolar/Swabs/Wash/Aspirate</p> <p>CONTAINER: Sterile VTM tube.</p> <p>Remark: Specimens are to be collected on swabs with a synthetic tip (nylon, polyester, or dacron) and an aluminum or plastic shaft, and must be sent with the patient case form.</p>
FEMALE-URETHRA	<p>PREPARATION: None</p> <p>SPECIMEN VOLUME & TYPE: Secretions for smear and culture</p> <p>CONTAINER: Sterile tube or swab with *TN</p> <p>TECHNIQUE: Digital massage through rectum</p> <p>INFO HELPFUL TO LAB: History of Chronic UTI</p> <p>COMMENT: Not recommended for GC cultures; useful in chronic UTI.</p>
MALE - URETHRA	<p>PREPARATION: Wipe clean with sterile gauze or swab.</p> <p>SPECIMEN VOLUME & TYPE: Urethral swab</p> <p>CONTAINER: Prefer direct planting onto *MTM and Chocolate slide (For Gram's stain)</p> <p>TECHNIQUE: Collect 2 - 4 HRS after urination with Urethral Alginate swab</p> <p>INFO HELPFUL TO LAB: History and duration of painful discharge</p> <p>COMMENT: Collect a slide for gram stain only.</p>
INTESTINAL - DUODENAL CONTENTS	<p>PREPARATION: Through NG Tube</p> <p>SPECIMEN VOLUME & TYPE: 2 - 4 ml</p> <p>CONTAINER: Sterile tube</p> <p>TECHNIQUE: Aspiration</p> <p>INFO HELPFUL TO LAB: Travel, food</p> <p>COMMENT: Examine for bacterial overgrowth, S. Typhi, parasites.</p>
FECES	(SEE LAB DOC AC0013)
RECTAL SWAB	<p>PREPARATION: None</p> <p>SPECIMEN VOLUME & TYPE: 3 Consecutive specimens</p> <p>CONTAINER: Swab with *TN</p> <p>TECHNIQUE: Swabs of lesions of rectal wall during Proctoscopy or Sigmoidoscopy preferred</p> <p>INFO HELPFUL TO LAB: Travel, food, suspected etiology</p> <p>COMMENT: Not useful for detection of carriers</p>
RSV	<p>PREPARATION: None</p> <p>SPECIMEN: Nasal Wash</p> <p>CONTAINER: Sterile screw cap cup</p> <p>WARD REMARK: RSV stored at room temperature ≤ 4 hours, up to 24 hours at 2-8 °C</p>

TEST NAME	REQUIREMENTS
GASTRIC ASPIRATE (NEONATAL)	<u>PREPARATION:</u> None <u>SPECIMEN VOLUME & TYPE:</u> 1-2 ml <u>CONTAINER:</u> Sterile container <u>TECHNIQUE:</u> Collected by provider <u>INFO HELPFUL TO LAB:</u> History of ruptured membranes
ORAL CAVITY - DENTAL OR ROOT ABSCESS	<u>PREPARATION:</u> Rinse mouth, prep with dry sterile gauze <u>SPECIMEN VOLUME & TYPE:</u> Exudate <u>CONTAINER:</u> Sterile syringe <u>TECHNIQUE:</u> Aspirate with needle and syringe <u>COMMENT:</u> Predominant pathogens are anaerobes
MUCOSA OR GUMS AND TEETH	<u>PREPARATION:</u> Rinse mouth <u>SPECIMEN VOLUME & TYPE:</u> Scraping swab <u>CONTAINER:</u> Swab <u>TECHNIQUE:</u> Use tongue depressor to contain tongue while culturing <u>INFO HELPFUL TO LAB:</u> Duration, agent suspected
NASOPHARYNX	<u>PREPARATION:</u> None <u>SPECIMEN VOLUME & TYPE:</u> Swab <u>CONTAINER:</u> Thin wire or flexible perinasal swab with *TN <u>TECHNIQUE:</u> Swab is passed through nose gently. Stay near septum and floor of nose and into nasopharynx. Rotate and remove. <u>INFO HELPFUL TO LAB:</u> Agent suspected <u>COMMENT:</u> Transport to lab immediately
NOSE	<u>PREPARATION:</u> None <u>SPECIMEN VOLUME & TYPE:</u> Swab <u>CONTAINER:</u> Swab with *TN <u>TECHNIQUE:</u> Insert swab about 1" into nose, gently rotate against nasal mucosa and remove <u>COMMENT:</u> Used mainly for Staph carriers
SPUTUM - EXPECTORATED DRAINAGE	<u>PREPARATION:</u> May require ultrasonic nebulization hydration, physiotherapy or postural <u>SPECIMEN VOLUME & TYPE:</u> Sputum (Not Saliva) 1-3 mL <u>CONTAINER:</u> Sterile specimen cup <u>TECHNIQUE:</u> Patient must cough deeply <u>INFO HELPFUL TO LAB:</u> Pneumonia, etc. <u>COMMENT:</u> May be refrigerated 12 hours
THROAT / PHARYNX	<u>PREPARATION:</u> None <u>SPECIMEN VOLUME & TYPE:</u> Swab <u>CONTAINER:</u> Swab with *TN <u>TECHNIQUE:</u> Swab area of exudation, membrane formation, or inflammation. Rub tonsillar crypts vigorously. DO NOT TOUCH TEETH OR MOUTH SURFACES. <u>INFO HELPFUL TO LAB:</u> Suspected bacterial agent.

TEST NAME	REQUIREMENTS
SKIN - BURN OR DECUBITI	<p>PREPARATION: Clean wound surface with 70% Alcohol.</p> <p>SPECIMEN VOLUME & TYPE: 3 - 4 mm dermal punch</p> <p>CONTAINER: Sterile container</p> <p>TECHNIQUE: Punch biopsy</p>
RASH	<p>PREPARATION: Clean rash surface with 70% Alcohol.</p> <p>SPECIMEN VOLUME & TYPE: Pus or fluid</p> <p>CONTAINER: Syringe</p> <p>TECHNIQUE: Direct syringe aspiration. Inject and aspirate 0.2 ml sterile saline</p>
SUPERFICIAL WOUND	<p>PREPARATION: Clean wound surface with 70% Alcohol.</p> <p>SPECIMEN VOLUME & TYPE: Pus, biopsy</p> <p>CONTAINER: Aspirate or swab in *TN</p> <p>TECHNIQUE: Swab or aspirate deep areas instead of lesion surface.</p> <p>INFO HELPFUL TO LAB: Animal bite or trauma, travel, duration of symptoms</p>
SUPPURATIVE LESION OF CLOSED ABSCESS	<p>PREPARATION: Clean and treat with antiseptic soap.</p> <p>SPECIMEN VOLUME & TYPE: More than 1 ml pus</p> <p>CONTAINER: Syringe or anaerobic container</p> <p>TECHNIQUE: Aspirate directly into syringe</p> <p>INFO HELPFUL TO LAB: Duration, location</p>
SKIN - UMBILICUS	<p>PREPARATION: No cleaning</p> <p>SPECIMEN VOLUME & TYPE: Swab</p> <p>CONTAINER: Swab with *TN</p> <p>TECHNIQUE: Swab area</p>
URINE BLADDER (SUPRAPUBIC, CYSTOSCOPIC)	<p>PREPARATION: None</p> <p>SPECIMEN VOLUME & TYPE: 1 ml urine</p> <p>CONTAINER: Sterile specimen cup</p> <p>TECHNIQUE: Collected by provider using needle aspiration or cystoscopy</p> <p>COMMENT: Must be plated within 2 hrs of collection or refrigerated</p>
CATHETER OR ILEAL LOOP	<p>PREPARATION: Disinfect tubing with alcohol</p> <p>SPECIMEN VOLUME & TYPE: 1 ml urine</p> <p>CONTAINER: Sterile specimen cup</p> <p>TECHNIQUE: Aspirate through tubing with syringe</p> <p>COMMENT: Must be plated within 2 HRS of collection or refrigerated</p>
CATHETER TIPS	<p>PREPARATION: None</p> <p>SPECIMEN VOLUME & TYPE: None</p> <p>CONTAINER: None</p> <p>TECHNIQUE: None</p> <p>COMMENT: Recommended to check new unused lots</p>
CLEAN VOIDED	<p>PREPARATION: Instruct carefully: Early morning specimen</p> <p>SPECIMEN VOLUME & TYPE: 1 ml urine - 2 consecutive on females</p> <p>CONTAINER: Sterile, wide mouth specimen cup</p> <p>TECHNIQUE: Clean genital area well; void 20 - 25 mL into toilet, then collect without stopping the stream.</p>

TEST NAME	REQUIREMENTS
	<u>COMMENT:</u> DO NOT CULTURE 24 HR URINES. Urines must be planted within 2 hrs of collection or refrigerated.

LEGEND OF ABBREVIATIONS:

- *TN - TRANSPORT MEDIA
- GC - NEISSERIA GONORRHOEAE
- UTI - URINARY TRACT INFECTION
- NSU - NON SPECIFIC URETHRITIS

III. COLLECTION PROCEDURE FOR GC/CHLAMYDIA DNA PROBE

A. Instructions for collection:

1. Endocervical swab specimens
 - a. Remove excess mucus from the cervical os and surrounding mucosa using the cleaning swab (white shaft swab in the package with red printing). **Discard this swab.**
 - b. Insert the specimen collection swab (blue shaft swab in the package with green printing) into the endocervical canal.
 - c. Gently rotate the swab clockwise for 10 to 30 seconds in the endocervical canal to ensure adequate sampling.
 - d. Withdraw the swab carefully; avoid any contact with the vaginal mucosa.
 - e. Remove the cap from the swab specimen transport tube and immediately place the specimen collection swab into the transport tube.
 - f. Carefully break the swab shaft at the scoreline; use care to avoid splashing of the contents.
 - g. Re-cap the swab specimen transport tube tightly.

2. **Male urethral swab specimens**
 - a. The patient should not have urinated for at least one hour prior to specimen collection.
 - b. Insert the specimen collection swab (blue shaft swab in the package with the green printing) 2 to 4 cm into the urethra.
 - c. Gently rotate the swab clockwise for 2 to 3 seconds in the urethra to ensure adequate sampling.
 - d. Withdraw the swab carefully.
 - e. Remove the cap from the swab specimen transport tube and immediately place the specimen collection swab into the specimen transport tube.
 - f. Carefully break the swab shaft at the scoreline; use care to avoid splashing of the contents.
 - g. Re-cap the swab specimen transport tube tightly.

3. **Urine specimens**
 - a. The patient should not have urinated for at least one hour prior to specimen collection.
 - b. Direct patient to provide a first-catch urine (approximately 20 to 30 mL of the initial urine stream) into a urine collection cup free of any preservatives. Collection of larger volumes of urine may result in

specimen dilution that may reduce test sensitivity.
Female patients should not cleanse the labial area prior to providing the specimen.

- c. Remove the cap and transfer 2 mL of urine into the urine specimen transport tube using the disposable pipette provided. The correct volume of urine has been added when the fluid level is between the black fill lines on the urine transport tube label.
- d. Re-cap the urine specimen transport tube tightly. This is now known as the *processed urine specimen*.

B. Specimen transport and storage before testing:

1. Swab specimens:

After collection, transport and store the swab in the swab specimen transport tube at 2° to 30°C until tested. Specimens must be assayed with the APTIMA Combo 2 Assay within 60 days of collection. If longer storage is needed, freeze at -20° to -70°C for up to 90 days after collection.

2. Urine specimens:

- a. After collection, transport the processed urine specimens in the GEN-PROBE APTIMA Combo 2 urine specimen transport tube and store at 2° to 30°C until tested. Processed urine specimens should be assayed with the APTIMA Combo 2 Assay within 30 days of collection. If longer storage is needed, freeze at -20° to -70°C for up to 90 days after collection.
- b. Urine samples that are still in the primary collection container must be transported to the lab at 2° to 30°C within 24 hours. Transfer the urine sample into the APTIMA Gen-probe urine specimen transport tube within 24 hours of collection. Store at 2° to 30°C and test within 30 days of collection.

STAT TESTING AVAILABLE FROM NMCP LABORATORY SERVICES

I. POLICY:

STAT testing should only be utilized in critical situations. The following procedures are offered on a STAT basis. Any requests for procedures not listed must be approved by a staff pathologist.

II. CHEMISTRY:

Ammonia	Ketones
Amylase	Lithium
Acetaminophen	Magnesium
BMP	Neonatal Bilirubin
BNP	Phenobarbital
BUN	Phenytoin
Calcium	Phosphorous
Carbamazepine	Quantitative HCG
CK/MB	Salicylates
Creatinine	Theophylline
CSF Protein, Total	Troponin 1
CSF Glucose	UDS
Digoxin	Valproic Acid
Electrolytes	Vancomycin
Chloride	Gentamicin
CO2	Glucose
Potassium	Ionized Calcium
Sodium	

III. HEMATOLOGY:

Body Fluid Cell Counts	Monospot
CBC	PT-INR/APTT
Hemoglobin/Hematocrit	Qualitative HCG
Platelet	Sickle Sreen
D-Dimer	Urinalysis with
Fetal Fibronectin	Microscopic

D MICROBIOLOGY:

CSF Gram Stain	Any Gram Stain from Surgery
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D TRANSFUSION SERVICE:

Type and Screen	IAT
Type and Crossmatch	DAT
ABO/Rh	Type & Screen Convert to Crossmatch

COMMUNICATING CRITICAL TEST RESULTS & VALUES

I. PURPOSE

To outline the identified department specific critical values, critical tests, the responsibilities, and procedures for reporting of critical tests and critical results to the health care providers (HCP) in a timely manner.

II. CRITICAL VALUES

The following tests and result limits are defined as critical values for the Laboratory and approved by the ECOMS.

CHEMISTRY		
TEST	CRITICAL LOW Less than or equal to:	CRITICAL HIGH Greater than or equal to:
BUN	N/A	80 mg/dL
Pro-BNP	N/A	1000 pg/mL
Calcium, ionized	0.86 mmol/L	1.74 mmol/L
Calcium, serum	6.5 mg/dL	13.0 mg/dL
Creatinine >16 years old	N/A	5.0 mg/dL
Creatinine <16 years old	N/A	2.5 mg/dL
Neonatal Bilirubin	N/A	15.0 mg/dL
Total Bilirubin	N/A	15.0 mg/dL
Glucose	40 mg/dL	400 mg/dL
Neonatal Glucose	40 mg/dL	300 mg/dL
CSF Glucose (adult)	40 mg/dl	N/A
CSF Glucose (neonatal)	30 mg/dl	N/A
Lactic Acid	N/A	2.9 mmol/L
Magnesium	1.0 mg/dl	5.0 mg/dl
Potassium	2.8 mmol/L	6.0 mmol/L
Neonatal Potassium	3.0 mmol/L	6.0 mmol/L
Sodium	125 mmol/L	160 mmol/L
Carbon Dioxide	10 mmol/L	40 mmol/L
Neonatal Carbon Dioxide	13 mmol/L	40 mmol/L
Phosphorous	2.0 mg/dL	N/A
Troponin I	N/A	0.12 ng/mL

THERAPEUTIC DRUG MONITORING		
TEST	CRITICAL LOW Less than or equal to:	CRITICAL HIGH Greater than or equal to:
Acetaminophen	N/A	50 mcg/mL
Carbamazepine	N/A	15 mcg/mL
Digoxin	N/A	2.2 ng/mL
Phenytoin (Dilantin)	N/A	30.0 mcg/mL
Lithium	N/A	1.9 mmol/L
Phenobarbital	N/A	44.0 mcg/mL
Salicylate	N/A	29 mg/dL
Theophylline	N/A	20 mcg/mL
Valproic Acid	N/A	120 mcg/mL
Gentamicin (trough)	N/A	1.9 mcg/mL (trough)
Gentamicin (peak)	N/A	11.9 mcg/mL (peak)
Vancomycin (trough)	N/A	20.0 mcg/mL (trough)
Vancomycin (peak)	N/A	44.9 mcg/mL (peak)
HEMATOLOGY		
AGE RANGE	CRITICAL LOW Less than or equal to:	CRITICAL HIGH Greater than or equal to:
WBC		
Newborn thru 18 years	2.0 mm ³	35.0 mm ³
Adult (19 years and above)	1.5 mm ³	35.0 mm ³
HEMOGLOBIN		
Newborn thru 180 days	9.0 g/dL	27.0 g/dL
181 days thru Adult	7.0 g/dL	21.0 g/dL
HEMATOCRIT		
TEST	CRITICAL LOW Less than or equal to:	CRITICAL HIGH Greater than or equal to:
Newborn thru Adult	20.00%	60.00%
Platelets	60,000/mm ³	800,000/mm ³
<i>Peripheral Blood Smear:</i>		
Parasites	ANY OBSERVED PARASITES	
WBC	ANY OBSERVED BLASTS	
CSF	ANY OBSERVED BACTERIA AND/OR YEAST	
COAGULATION		

TEST	CRITICAL LOW Less than or equal to:	CRITICAL HIGH Greater than or equal to:
Prothrombin Time	N/A	60 sec
INR	N/A	4.5
PTT	N/A	150 sec
Fibrinogen	50 mg/dL	700 mg/dL
URINALYSIS		
TEST	CRITICAL LOW Less than or equal to:	CRITICAL HIGH Greater than or equal to:
Glucose (child < 18 yrs)	N/A	500 mg/dL
Adults only and only if both elevated (Ketones and Glucose)	N/A	80 mg/dL
	N/A	500 mg/dL
RESPIRATORY THERAPY		
TEST	CRITICAL LOW Less than or equal to:	CRITICAL HIGH Greater than or equal to:
PO ₂	Less than 40 mm Hg	N/A
pH	Less than 7.20	N/A
PCO ₂	N/A	Greater than 60 mm Hg
MICROBIOLOGY		
TEST or CULTURE	CRITICAL RESULT	
Blood Cultures	All Positive Cultures	
Respiratory Cultures	Multi-drug resistant <i>S. aureus</i> , and/or <i>Pseudomonas aeruginosa</i> and/or Burkholderia cepacia from a Cystic Fibrosis patient.	
Any Culture/Any Source	Any multi-drug resistant <i>Acinetobacter spp.</i>	
	All Specimen Sources - VRE (Vancomycin Resistant Enterococcus)	
	Any Select Agent as described in the Laboratory Response Network (LRN) plan and VA State Lab Reportable List	
CSF Cultures	All Positive Cultures	
Eye Cultures	<i>Pseudomonas</i> Species, Enterococcus	
Urine/Wound Cultures	Group A Streptococcus	
CSF Gram Stain	Positive Results	
Synovial Fluid Gram Stain	Positive Results	
Operating Room Gram Stain	Positive Results	
Fecal Cultures	All fecal enteric pathogens isolated	

All Cultures with source other than Throat	All positive cultures with Grp. A Strep
AFB Smear	Any Source - All POSITIVE AFB SMEARS
HSV Cultures	All Positive HSV cultures on CSF or Pediatric samples
PCR Testing	All Positive Results
BLOOD BANK	
TEST	CRITICAL RESULT
Antibody Screen IAT	Positive
Antibody Screen DAT	Positive
Crossmatches	Incompatible
Rh positive cord blood with Rh negative mother	Mother candidate for RhIg
ANATOMIC PATHOLOGY*	
DEPARTMENT	DIAGNOSIS
Dermatology	Malignant Melanoma
ENT	Any Malignancy
Gastroenterology	Any Malignancy Any flat dysplasia in a patient with chronic colitis
General Surgery	Any Malignancy
Family Practice	Malignant Melanoma Cervical Carcinoma
Neurology	Malignancy CSF Cytology
Neurosurgery	Any Neoplasm except lipomas All Stereostatic Biopsy results
OB/Gyn	Any Malignancy
Orthopedics	Any Malignancy
Ophthalmology	Any Malignancy Giant Cell Arteritis
Oral Surgery	Any Malignancy
Plastic Surgery	Any Malignancy
Pulmonary Medicine	Any Malignancy Presence of Pneumocystis or AFB
Urology	Any Malignancy
Thoracic and Vascular Surgery	Any Malignancy Disagreement between Frozen Section and Final Diagnosis
*Although these values for Anatomic Pathology are listed as critical, they are not time critical, but must be called back after diagnosis is confirmed and documented in the COPATH report.	
POINT OF CARE TESTING	

Test	Critical Low	Critical High
ACCU-CHEK INFORM: GLUCOSE 31 Day-Adult	Less than or equal to 40 mg/dL	Greater than or equal to 400 mg/dL
ACCU-CHEK INFORM: GLUCOSE: Newborn-30 days	Less than or equal to 40 mg/dL	Greater than or equal to 300 mg/dL
Fecal Occult Blood	POSITIVE	
Gastric Occult Blood	POSITIVE	
Hemocue Hemoglobin	Less than or equal to 7.0 G/dL	Greater than or equal to 20.0 G/dL
Rapid Strep	POSITIVE	
HCG	Unknown Positive In a Pre-Op Patient	
Provider Performed Microscopy (PPM)	Determined by Provider	
Urinalysis: Ketones &Glucose *Adults only and only if both elevated (Ketones & Glucose)	N/A	Greater than or equal to 80 mg/dL
	N/A	Greater than or equal to 500 mg/dL
Activated Clotting Time	Clinic/Procedure Specific	
I-STAT		
Test	Less than or equal to	Greater than or equal to
Sodium	125 mmol/L	160 mmol/L
Potassium	2.8 mmol/L	6.0 mmol/L
Ionized Calcium	0.86 mmol/L	1.74 mmol/L
Test	Less than or equal to	Greater than or equal to
pH	LESS THAN 7.20	N/A
PCO ₂	N/A	Greater than 60 mm Hg
PO ₂	Less than 40 mm Hg	N/A
Hematocrit	20%	60%
TCO ₂	10 mmol/L	40 mmol/L
Creatinine	N/A	Greater Than 5.0 mg/dL
Glucose	40 mg/dL	400 mg/dL
Urea Nitrogen	N/A	80 mg/dL
Hemoglobin	7 g/dL	20 g/dL
Troponin (cTnI)	N/A	0.12 ng/ml

AVOX	
Oxyhemoglobin	Oxyhemoglobin critical values are determined on a case by case basis by the cardiologist performing the catheterization.

III. CRITICAL TESTS:

The following tests are defined as critical tests for the Laboratory:

CRITICAL TESTS (All results reported as critical whether normal or abnormal)
Intra-operative PTH
Intra-operative Frozen Sections
Fetal Fibronectin
Rapid HIV

IV. TIMELINESS OF REPORTING CRITICAL TESTS & CRITICAL VALUES:

A. The TAT for all critical values is **forty-five (45) minutes**.

1. The defined TAT for critical value is from the time the result is recognized as critical and validated to the time the HCP is notified of the results.

B. The current defined critical tests monitors and turnaround times (TAT) are as follows:

TEST NAME	TAT
Intra-op frozen section	35 minutes
Intra-op PTH	30 minutes
Fetal Fibronectin	2 hours (120 minutes)
Rapid HIV	2 hours (120 minutes)

1. The defined TAT for a critical test is from the time test is ordered to the time the HCP is notified of the results, whether positive, negative, critical, or normal.

V. Reporting Results:

1. Reporting critical values/tests will include a verification "read-back" by the person receiving the results. The verification "read-back" policy is required for all critical reports that are communicated verbally or by telephone.
2. Be prepared to provide additional information to duty health care provider such as a home telephone number of the patient for whom we are calling the result, and DOB if asked, by using ^MRG in CHCS.

3. **Inpatients:**
When a critical value/test is identified, those results will be communicated to the ordering physician/provider, designee, or the nurse on the appropriate patient care unit, via direct verbal communication (in person or by telephone).
4. **Outpatients:**
During normal working hours clinically relevant critical results/tests, will be called to the responsible physician/provider or designee. During non-working hours critical results/tests ordered at branch clinics or NMCP Family Practice Clinic, will be called to the On-Call Family Practice Provider.
5. **Notification sequence:**
The following priority sequence (approved by ECOMS) is used when calling Critical Values/Tests or other required telephone test reports. This will be followed until one of the listed health care professionals is contacted. The same procedure will be used when a critical value is received from a Reference Laboratory.
 - a. **Inpatient:**
 - 1) (Ordering) health care provider or designee*
 - 2) Requesting location charge nurse/floor supervisor
 - 3) Duty medical officer covering the requesting location.
 - b. **Outpatient:**
 - 1) Page responsible (Ordering) health care provider or designee*
 - 2) Duty medical officer covering the requesting location.

***Designee includes residents, interns, and charge nurses.**
6. When the patient's responsible HCP is not available, utilize the notification sequence listed above (5).
7. Make each subsequent attempt within approximately ten (10) minutes of previous unsuccessful call. Continue to page and follow the sequence listed above until the responsible HCP/designee is contacted. If unable to contact anyone, the results will be given to the duty pathologist for action. Completely document every call in a Critical Result/Tests Log book, worksheet or instrument report print out.
8. **Emergency Department Alternate number:**
The ED provided the Laboratory with an alternate number to call in the event that main number is busy or the tech is put on hold for an excessive period.
 - a. If the primary ED number 3-1365 is busy, the tech is to contact the triage desk 3-7219 with critical values/tests.

- b. Request to speak to the triage nurse, and then give the critical value/test information to the triage nurse.
- c. The triage nurse will contact the on-duty staff physicians with the results.

VI. BHCs HOURS OF OPERATIONS:

Reporting critical values/tests to the Branch Clinics, Langley AFB, FT Eustis or Ft. Lee after normal hours of operation, notify the listed contact phone.

Facility	Hours of Operation	Laboratory Phone Number	After hours phone number
Branch Health Clinic Dam Neck	0700-1530 M-F Closed Group A & B	953-9879	628-8805 Answering service will page Family Practice HCP on call
Branch Health Clinic Norfolk (Sewell's Point)	0700-1530 M-F Closed Group A & B	628-8958	628-8805 Answering service will page Family Practice HCP on call.
Ft Eustis (McDonald Army Health Center)	0730-1900 M-F 0800-1700 Sat-Sun Closed Group A & B	314-7580	757-508-2949 AOD will provider number to the on-call doctor who will then call us back.
Ft Lee (Kenner Army Health Center)	0700-1600 M-F Closed Group A & B	Commercial: 804-734-9106, 804-734-9110, 804-734-9113, 804-734-9105; DSN Prefix:687	804-734-9000 AIO will call HCP who will cal us back
Langley Air Force Base (First Medical Group Hospital)	Monday-Sunday 0700-1630 Closed Group A & B	764-6925	Call Laboratory, if no answer call Langley ER 764-6800. Have the ER contact the Duty Laboratory Technician to call the NMCP Laboratory.
Naval Weapons Station, Yorktown	0700-1600 M-F Closed Group A & B	953-8440	628-8805 Answering service will page Family Practice HCP on call.
TRICARE Prime Boone	0700-1900 M-F 0700-1900 Sat-Sun & group A Closed Group B	953-8219	628-8805 Answering service will page Family Practice HCP on call
TRICARE Prime Chesapeake	0700-1900 M-Sat, & Group A Closed Group B	953-6323 953-6324 Nurses: 3-6354, 6355, 6356	628-8805 Answering service will page Family Practice HCP on call
TRICARE Prime Northwest	0700-1530 M-F Closed Group A & B	953-6284	628-8805 Answering service will page Family Practice HCP on call

Facility	Hours of Operation	Laboratory Phone Number	After hours phone number
TRICARE Prime Oceana, NAS	0700-1900 M-F Closed Group A & B	953-3827 Nurses: 3-3852	628-8805 Answering service will page Family Practice HCP on call
TRICARE Prime Virginia Beach	0700-1900 M-F 0700-1900 Sat-Sun & group A 0900-1700 Group B	953-6680 953-6681 Nurses: 3-6672 3-6673	628-8805 Answering service will page Family Practice HCP on call
Branch Health Clinic NNSY	0700-1530 M-F Closed Group A & B The specimen Processing area closes at 1400.	953-6454: Primary Care 953-6478: Acute Care	314-8404 Duty HM will notify the requesting provider

Group A- Martin Luther King, President's Day, Columbus Day & Veteran's Day

Group B- Thanksgiving, Christmas, New Year's, Memorial Day, Labor Day, and Independence Day

SPECIMEN SUBMISSION FOR HIV TESTING

I. BACKGROUND

- A. Four categories of specimens are routinely submitted for the testing of HIV:
 - 1. Category 1: Samples submitted for BUMED Navywide HIV Program (Force Testing) for active duty personnel assigned to Navy commands within Naval Medical Center Portsmouth's area of responsibility:
 - a. Ships/Outlying Commands
 - b. Naval Medical Center Portsmouth
 - 2. Category 2: Patient specimens (active duty, dependent, retired) from Naval Medical Center Portsmouth (NMCP) inpatient wards and outpatient clinics.
 - 3. Category 3: Patient specimens from Branch Health Clinics.
 - 4. Category 4: Specimens submitted from Occupational Health for Needlestick protocol initial testing on the source and staff and smallpox immunizations, Emergency Medicine Department (Needlestick protocol initial testing on the source and OB patients who are delivering and have not had an HIV test performed); Labor and Delivery for suspect HIV positive mother.

- B. Specimens falling under Categories 1, 2, and 3 above will be shipped to the Navy HIV Contract Laboratory (Center for Disease Detection Laboratory or CDD). Specimens in Category 4 above are tested in-house using the Oraquick Rapid HIV test kit. Positive category 4 samples are automatically sent to Navy HIV Contract Laboratory (CDD) for confirmatory testing.

II. SPECIMEN SUBMISSION:

- A. Category 1 Specimen Submission (Force Testing) Ships/Outlying Commands
 - 1. Specimens can be submitted by ordering tests in CHCS (if available) or on a SAMS using HMSLoader. Detailed instructions for submission can be obtained by contacting the HIV referral section of the Laboratory at (757)953-1594.
 - 2. Supplies required for collection and submission of HIV samples;
 - a. 7mL, plastic, barrier-gel collection tubes (Tiger tops)
 - b. Vacutainer Holders
 - c. SAMS Program (version 08.03.02 only).
 - d. 3 ½" computer disks
 - 3. The following information is required on each specimen tube and must be LEGIBLE:
 - a. Last Name
 - b. First Name
 - c. Family Member Prefix/ Sponsor SSN
 - d. Date of Birth
 - 4. Specimen must be processed within 6 hours of collection as follows:

Allow the specimens to clot for at least 30 minutes.
Centrifuge the specimens at 1100 - 1300 g for a minimum of 10 minutes.

5. **Submission using SAMS:**

- a. For submission using SAMS, place tubes in the same order as on the disc. Enclose a printed copy of the roster at the time of submission and ensure that the printed copy, disc and specimens are all in the same order. Upon submission, the draw date must be within 7 days to avoid rejection.
- b. All sample information MUST be correct (on tube and computerized roster) to avoid delays in processing.
- c. Ensure barcodes are placed on the top third of the tube. The numbers should be vertical.
- d. Source of Test Code for Category 1 specimens will be "F" for general testing.
- e. Samples may be delivered to NMCP HIV section from 0700 to 1330 Monday through Friday.
- f. Results
 - 1) Final test results will be individual and summary report on a PDF format to be returned to submitting activities via 3 ½" computer disk.
 - 2) Reprints of results can be obtained by e-mailing Navy Central HIV Program Office at NCHP@med.navy.mil.
 - 3) Results WILL NOT be faxed or given via the telephone.

6. **Submission using CHCS:**

- a. Submitting sites can order HIV tests in CHCS as HIV-1 AB. Specimens will be accessioned and labeled by submitting site staff.
- b. Supplies required for collection and submission of HIV specimens;
 - 1) 7ml, plastic, barrier-gel serum separator tubes (Red/yellow or Tiger tops)
 - 2) Vacutainer Holders
- c. The following information is required on each specimen tube and must be LEGIBLE:
 - 1) Last Name
 - 2) First Name
 - 3) Family Member Prefix/Sponsor SSN
 - 4) Date of Birth
- d. All sample information MUST be correct (on tube and in CHCS) to avoid delays in processing.
- e. Results
Results will be available to the ordering official in CHCS.

B. Category 2 Specimen Submission - NMCP Patients

1. Specimens must be ordered in CHCS under HIV1/0/2. A printout of the order must accompany the specimen to the Specimen Processing section of the Laboratory.
 - a. The specimen should be submitted in 7ml, plastic, barrier-gel serum separator tubes (Red/Yellow or Tiger tops).

2. All sample information MUST be correct (on tube and in CHCS) to avoid delays in processing or resubmission of specimens.
 3. The following information is required on each specimen tube and must be LEGIBLE:
 - a. Last Name
 - b. First Name
 - c. Family Member Prefix/Sponsor SSN
 - d. Date of Birth
 - e. Ward/Clinic
 4. Source Test Code for samples ordered in CHCS maybe:
 - a. ETOH/Drug Rehab
 - b. Blood Donor
 - c. Referred HIV Contact
 - d. Deceased (Whether DOA or Dying in ER)
 - e. MEPCOM
 - f. Force Screening
 - g. BUMED Use Only
 - h. Post-Deployment Serum Storage
 - i. Clinically Indicated
 - j. Prisoners or Detained Persons
 - k. Medical Admissions (Including Psych.)
 - l. Pre-Deployment Air Force/Army/Navy
 - m. OB/GYN
 - n. Physical Exam
 - o. Evaluation Unit Patient
 - p. Requested by Individual
 - q. Surgical Admission
 - r. Post-Deployment Air Force
 - s. STD Clinic Visit
 - t. Double Elisa Pos, Conf. BB Unit only
 - u. Any other test or source
 - v. Redrawn (Double Elisa Pos) Pt/Clinical
 5. The specimens will be accessioned to the N22 accession area by the Specimen Processing section of the Laboratory.
 6. All HIV results entered into the CHCS system are protected. A special code assigned by MID or the CHCS system manager must be in place in order to view or retrieve these results. Authorization for this code is limited to Mail-outs/HIV section staff, isolated health care practitioners who have a need to know, and staff physicians. Contact the Client Services supervisor or the Mail-outs/HIV section for any questions regarding this policy.
 7. RESULTS WILL NOT BE GIVEN TO THE PATIENT, FAXED, OR GIVEN OVER THE PHONE. All reprint requests for HIV results should be directed to the HIV/Mail-outs section of the Laboratory.
- C. Category 3 Specimen Submission: Branch Clinics
1. Specimens will be submitted to the Specimen Processing Branch of the Laboratory via CHCS transmittal list.
 - a. A copy of the transmittal list is required for sample submission.
 - b. Ensure the transmittal list has been sent electronically in CHCS.
 - c. Ensure the specimens are in the transmittal list order.

- d. If an accession needs to be cancelled for any reason, please annotate on the transmittal list and staff will cancel the appropriate test.
- D. Category 4 Specimen Submission: Occupational Health/Emergency Room Needlestick Protocol/Labor and Delivery/OB
- 1. Specimens must be ordered in CHCS under HIV-1+2 AB.
 - a. A printout of the order must accompany the specimen to the Specimen Processing branch of the Laboratory.
 - b. Ensure that NEEDLESTICK is annotated on the CHCS printout or on the CONSENT FORM. If this is not clearly indicated, the specimen will be sent to CDD as a Mail-out test.
 - c. The specimen should be submitted in 5 ml lavender tube.
 - 2. All sample information MUST be correct (on tube and in CHCS) to avoid delays in processing or resubmission of specimens.
 - 3. The following information is required on each specimen tube and must be LEGIBLE:
 - a. Last Name
 - b. First Name
 - c. Family Member Prefix/Sponsor SNN
 - d. Date of Birth
 - e. Ward/Clinic
 - 4. Source Test Code for Category 4 specimens may be:
 - a. O OB/GYN
 - b. X Any other test or source
 - 5. The specimens will be accessioned to the PHE accession area by the Specimen Processing section of the Laboratory.

III. RESULTS REPORTING:

- 1. Once positive result is confirmed, Navy Central HIV Program will perform the following.
 - A. For active duty member:
 - a. Notify HIV POC to hold barcode via email.
 - b. Notify CO of active duty member.
 - c. Once the CO is notified, NCHP will notify HIV POC to release barcode.
 - d. HIV POC will then certify the result in CHCS and acknowledge NCHP's email that the result has been released.
 - B. For retired members and dependents:
 - a. NCHP will notify HIV POC via email to forward hardcopy result to Health Care Provider.
 - b. HIV POC will acknowledge NCHP's email that hardcopy result has been forwarded to HCP and the result will be certified in CHCS.
- 2. All HIV results entered into the CHCS system are protected. A

special code assigned by MID or the CHCS system manager must be in place in order to view or retrieve these results. Authorization for this code is limited to Mail-outs/HIV Section staff, isolated health care practitioners who have a need to know, and staff physicians. Contact the HIV section section staff for any questions regarding this policy.

3. RESULTS WILL NOT BE GIVEN TO THE PATIENT, FAXED OR GIVEN OVER THE PHONE. All reprint requests for HIV results should be directed to the HIV/Mail-outs section of the Laboratory.

IV. **NOTES:**

- A. For specimen categories 1-3: Specimens that cannot be delivered to CDD Laboratory within 7 days of collection must be transferred to the 5.0 ml screw-cap collection tubes and frozen (-20 C).
- B. There are instances that specimens will be rejected (i.e., gross hemolysis, identification problems, leakage during transport, quantity not sufficient, unscannable barcodes).
- C. In the event that a specimen is rejected, a comment will be placed in CHCS.

V. **REFERENCES:**

- A. Navy HIV Program SOP, JUN 95
- B. SECNAVINST 5300.30C
- C. Center for Disease Detection SOP, Oct 2008

LEGAL ALCOHOL, TOXICOLOGY SPECIMEN SUBMISSION AND PATERNITY TESTING

I. PURPOSE

To establish policy and procedures governing the proper submission of specimens for legal alcohol and toxicology testing.

II. TOXICOLOGY EXAMINATION- REQUEST AND REPORT (AFIP Form 1323)

- A. AFIP Form 1323 must accompany all requests for legal toxicology examinations to ensure that specimens resulting from legal investigations are handled as evidence. A continuous chain-of-custody and positive identification of samples are imperative.
- B. The Laboratory accepts specimens for legal toxicology. All specimens will be submitted directly to:
 - Armed Forces Institute of Pathology
 - Attn: Division of Forensic Toxicology
 - Building 54
 - 6825 16th Street, N. W.
 - Washington, DC 20306-6000
 - Phone Number: (301) 319-0100 DSN: 285-0100

NOTE: The Laboratory **does not collect urine specimens for legal purposes or for active duty drug screening programs.** Such specimens are the responsibility of a Command's Drug Screening Program official.

III. SUBMISSION OF LEGAL ALCOHOL SPECIMENS

- A. The Laboratory at Naval Medical Center, Portsmouth, Virginia performs blood alcohol determinations for **medical or administrative purposes only.** This laboratory does not use an ethanol test methodology that is specific for legal use. Therefore, any blood alcohol levels which may be used in court proceedings (civil court or court martial) must be submitted with a chain-of-custody document and will be mailed to the appropriate testing facility.
- B. All legal alcohol specimens must have two gray top tubes (NaFl anticoagulant) submitted with the completed DD 1323 and sealed in an appropriate container. All blocks must be completed.
- C. Collection of the legal alcohol can be performed by the Laboratory as requested. During working hours, refer persons to Outpatient Phlebotomy. After working hours, refer the persons to the Senior Laboratory Technician. Persons are to be escorted by the requesting command officials or NMCP Security and are to remain until specimen collection is completed. The requesting/submitting command, or location, is to have the appropriate written authorization (AFIP 1323 Form) from command authorities. The chain of custody begins with the person who draws the blood.

PATERNITY TESTING

Paternity testing is not available at the Naval Medical Center, Portsmouth.

PATIENT LABORATORY REPORTS

- I. Upon completion, all laboratory studies will be certified in CHCS by an appropriate member of the laboratory staff. Authorized health care providers may access all lab results on line in CHCS and print these reports if desired.

Outpatient or off site requests for hard copy results may be submitted to the Medical Records department for processing.

- II. Civilian health care providers not credentialed at Naval Medical Center, Portsmouth requesting a laboratory report ordered by a military health care provider must fax a completed patient medical records release form signed by the patient to 953-6660.

BLOOD SPECIMEN COLLECTION BY VENIPUNCTURE

I. PRINCIPLE

To obtain blood for analysis by vacutainer or syringe methods. Glass/plastic tubes under specified vacuum allow predetermined volumes (2mL, 3mL, 4mL, 5mL, 7mL, and 10mL) to enter the tubes while syringe collection methods allow volumes to be collected according to the syringe volume and pressure that is adjustable by the phlebotomist.

II. REAGENTS, SUPPLIES & EQUIPMENT

A. Vinyl or Nitryl gloves (Latex free)

B. Phlebotomy Needles

1. Needle gauge selection is based upon the patient's physical characteristics.
2. Since the larger the number, the smaller the bore size, the larger bore size causes blood to flow quickly while the smaller bore size causes blood to flow slower.
3. For adults, the general gauge of choice is 20 gauge, however, if the patient has small veins 21 or 23 gauge may be more appropriate.
4. 21 or 23 gauge needles or collector (needle with tubing & tube piercing device) are appropriate for pediatric patients.

C. Evacuated Collection Tubes or Syringes

1. Choose the tube or syringe size according to the quantity required for the test(s) requested, and by the size and condition of the patient's vein.
2. The most common correlation between vacutainer stopper color & additives is as follows:

STOPPER	ADDITIVE
Plain Red	None
Tiger Top	Serum separator gel/no additive
Light Blue w/ Yellow label	Thrombin (obtain from Coagulation/Hematology)
Yellow	Acid/Citrate/Dextrose
Light Blue	Citrate
Green	Li Heparin/Na Heparin
Lavender	Potassium EDTA
Royal Blue	Sodium Heparin or EDTA (Heavy metals)
Gray	NaF/K Oxalate
Pink	K2EDTA

D. Cleansing Agents

1. 70% isopropyl alcohol
2. 1% Providone-Iodine swab sticks for sterile collection or Blood ETOH.

E. Sterile Drying Agents

1. Gauze pads (2 in. x 2 in. or 3 in. x 3 in.) for general use.
2. Cotton balls for patients with dermatitis.

G. Tourniquets

1. For general use, soft, latex-free rubber tubing or a Velcro band is acceptable.
2. For pediatric patients, use round, latex free, rubber tubing.

III. **QUALITY CONTROL**

- A. All equipment & supplies are routinely checked for compliance with expiration dates.
- B. Expired equipment and supplies will be discarded and replaced by in date material(s).

IV. **PROCEDURE**

NOTE: If the patient is unable to understand the English language, please contact the OOD desk (x3-5008) for an interpreter.

- A. Obtain orders from patient record or CHCS.
- B. Ensure patient identification
 1. Match the ID band or ID card to requisition form by asking the patient to recite his full name and date of birth. If patient's ID band or card do not match the requisition form or labels:
 - a. do **not** collect any specimens;
 - b. verify the correct identity of the patient.
 2. If the patient is unconscious, too young, mentally incompetent, or does not speak the language of the phlebotomist, ask the nurse, a relative, or a friend to identify the patient by name and date of birth before drawing blood.
 3. Procedure for unidentified Emergency Patients: Each patient should be given a temporary, but clear designation until positive ID can be made. In all cases, the name and number of the emergency ID should be attached to the patient's body either by wristband or similar device.
- C. Confirm adherence to diet restrictions, by verbal ID if necessary.
 1. General fasting for glucose, etc., is 8-10 hours.
 2. Fasting state for lipid studies is 12-14 hours.
 3. All fasts include: No food or beverage intake (including coffee), and no gum or cigarettes. **Patients MAY HAVE WATER OR CRUSHED ICE.**
 4. Contact the patient's health care provider for guidance on ingestion of prescribed medication by the patient while fasting. Instruct patient to drink water only when taking medication.
- D. Reassure Patient

1. Gain the patient's confidence and assure the patient that the process will be of short duration.
 2. Inform the patient when the needle enters the skin to minimize fright and tension.
 3. Do not say, "This won't hurt"
- E. Position Patient Properly.
1. Extend the arm such that a straight line is formed from shoulder to wrist.
 2. This position ensures access to the antecubital fossa easily and comfortably.
- F. Assemble all Equipment & Supplies (See Item III A-C).
- G. Select a Vein Site.
1. A venipuncture site may be selected without wearing gloves. Gloves must be worn during the actual venipuncture.
 2. Veins of the antecubital fossa, median cubital, cephalic or basilic veins are preferred.
 3. Check the antecubital fossa of both arms before selecting the site by feeling with the fingertip for bounce, vein direction, depth and size.
 4. Do not draw from an arm that is receiving intravenous therapy.
 5. If the patient has had a mastectomy, use the opposite arm to avoid lymphostatic interferences with the blood specimen.
 6. Choose another vein or another arm if a hematoma exists. If other sites are not available, apply tourniquet below the hematoma. In instances when a tourniquet is applied for site selection, release before cleansing.
 7. In cases where the patient has had a double mastectomy or some other reason that the arms cannot be used, the requesting provider will be contacted to discuss alternate collection methods.
- H. Cleanse and Dry the Venipuncture Site.
1. Using 70% isopropanol, or 1% Providone when necessary, cleanse in circular motion beginning at the center of the vein site working outwardly for about one inch in diameter.

NOTE: Alcohol pads must not be used when obtaining specimens for blood alcohol tests or blood cultures.
 2. Allow the alcohol to air dry or wipe away alcohol with sterile gauze pads or cotton balls.
- I. Apply the Tourniquet.
1. Place the tourniquet 3-4 inches above the venipuncture site.
 2. For valid results, the tourniquet should not be left on the arm more than one minute as this will result in a disruption of the balance of fluids and blood elements.
- J. Inspect the Needle.

1. Ensure that the needle is fastened securely into the vacutainer holder or syringe.
 2. When ready for use, remove the needle cover to determine that the needle is free of hooks at the end of the point and that the bore is free of small particles which could obstruct blood flow.
- K. Perform the Venipuncture.
1. Anchor the vein firmly above & below the puncture site using the thumb & index finger, or thumb & middle finger.
 2. Holding the skin taut with the thumb, enter the vein with the needle bevel upward at a 15 degree angle. Follow the vein geography to secure the needle.
 3. Vacutainer (evacuated) system:
 - a. Most commonly used for routine phlebotomy.
 - b. Place a vacutainer tube into the holder without completely penetrating the rubber stopper on the vacutainer tube with the needle.
 - c. Use one hand to hold the tube holder while using the other hand to gently insert the first tube all the way onto the needle, and allow the vacuum to fill the tube.
 - d. After the flow of blood into the tube has ceased, gently remove the tube and insert another tube as needed. Continue the process until all tubes are filled.
 4. Butterfly system:
 - a. Ideal for pediatrics, difficult draws, and drawing from the wrist and back of the hand.
 - b. Place a vacutainer tube into the holder without penetrating the needle completely through the rubber stopper and remove the needle cover.
 - c. Gently and quickly enter the vein. Hold the "butterfly" tabs to secure the needle in the vein while drawing blood.
 - d. If necessary, have an assistant gently push the vacutainer tube all the way into the holder, and allow the vacuum to fill the tube.
 - e. After the flow has ceased, gently remove the tube and insert another as needed. Continue until all tubes are filled.
 5. Syringe system:
Transfer blood to appropriate labeled tubes, taking caution not to hemolyze the specimen(s) and observing needle safety.
 6. Tube collection sequence:
 - a. To prevent contamination of specimens, collect non-additive tubes first, followed by barrier gel tubes, then citrate, followed by Heparin, EDTA-K3, and fluoride-oxalate tubes.
- L. If the Sample cannot be obtained:
1. Change the position of the needle.
 2. Try another tube.
 3. Loosen the tourniquet.
 4. **Do not probe.**
 5. Repeat one more time, or have another phlebotomist try. Never attempt to draw a sample more than twice on the same patient without explicit permission from the patient.

- M. Release the Tourniquet.
 1. Allow the patient to open his/her hand.
 2. Fold the clean gauze in fourths and place it over the needle.
- N. Remove the needle.
 1. Withdraw the needle gently but quickly.
 2. Apply pressure to the venipuncture site for 3-5 minutes. Keep arm straight; don't fold.
- O. Mix or Fill and Mix Tube(s).
 1. Mix additive tubes by gentle inversion.
 2. For syringe collections, transfer blood to the appropriate tubes and gently mix by inversion.
 3. Do not invert non-additive tubes.
- P. Check the Patient.
 1. Ascertain the patient's condition, e.g., look for signs of fainting.
 2. Remove the gauze pad to check that the bleeding is under control. Apply a bandage.
- Q. Engage needle safety device and place entire system into a hazardous waste receptacle (B-D sharps, collectors or equivalent).
SAFETY NOTE: Never attempt to recap or cut a needle.
- R. Perform special handling procedures such as chilling, incubation, etc., when appropriate.
- S. Identify the specimen
 1. Label the specimen according to laboratory requirements.
 2. Record initials of collector, time of collection, and collection location on each tube.
 3. Second verification takes place at the Blood Bank issuance desk, checking specimen names, paperwork and collector's initials all match.
- T. Deliver the specimen to the Laboratory via courier or tube system, if specimen collected outside laboratory.

V. **PROCEDURE NOTES**

- A. Wear gloves when collecting patient's blood; change gloves between patients.
- B. When collecting drug levels, record the quantity of each dose, time of ingestion and the time of collection on the request forms.
- C. When collecting below an IV site, record on request form(s) the type of IV, length of time turned off, and site of collection.
- D. Special Patients
 1. A cyanotic person's blood is usually thick; thus apply warm compresses and use a larger gauge needle to collect the specimen.

2. Bend the elbow of obese patients to feel the vein; it may not be as deep as they feel.

E. Prevention of Hematoma

1. Fully puncture only uppermost wall of vein.
2. Remove tourniquet before needle.
3. Use the major veins.
4. Apply pressure to puncture site and do not bandage until any bleeding has stopped.

VI. **LIMITATIONS OF PROCEDURE**

- A. Tests requiring chilling to decrease metabolic processes are gastrin, ketone, lactic acid, renin, and vitamin C (ascorbic acid).
- B. Serum for cold agglutinins must be maintained at room temperature or 37°C to avoid false negative values.
- C. If a vacutainer tube fails to fill with blood, it may have lost vacuum. Keep the needle in the patient's vein, and insert another tube into the holder.
- D. Veins will collapse when blood is drawn from them too quickly. The needle bore may be too large, or the pressure applied to a syringe plunger may be too strong.
- E. Some additive tubes contain pre-measured amounts of anticoagulant. To ensure appropriate ratio of anticoagulant to blood, fill tubes as follows:
 1. Heparin tubes are acceptable when half to completely full.
 2. EDTA, Citrate, and fluoride-oxalate tubes are acceptable only when filled to the appropriate capacity.
- F. When no site can be found except the area of IV administration, it is possible to draw below the IV site by the following procedure:
 1. Turn off IV for 2 minutes.
 2. Apply tourniquet below IV site.
 3. Draw 5ml blood and discard.
 4. Collect test sample.
 5. Withdraw needle and apply firm but not tight bandage.
 6. Restart IV.
- G. Hemolysis:
 1. The serum/plasma has a pink to red color.
 2. It may be caused by:
 - a. Using needle(s) with too small a bore
 - b. Shaking the blood too vigorously.
 - c. Collecting from a hematoma site.
 - d. Centrifuging blood before clotting.
 - e. Alcohol left on skin.
 - f. Increased RBC fragility and increased HCT levels.
- H. Patient care during special situations:
 1. Fainting/light-headedness during/after phlebotomy:

- a. Immediately remove the tourniquet and the needle from the patient's arm.
 - b. If the patient is sitting, lower his/her head and arms. Allow the patient to slide forward and lower him/her to the floor.
 - c. Loosen tight clothing and elevate his/her legs.
 - d. Apply cold compresses to the forehead and back of the neck if necessary.
 - e. If the patient has fainted, call his/her name while patting his/her hand or face.
 - f. If the patient has fainted, and does not respond to the previous instructions, administer an ammonia inhalant. Break the ammonia capsule away from you and the patient. Wave the ammonia inhalant several times away from the patient then wave the inhalant about three inches under the patient's nose. The patient should respond by coughing.
- CAUTION:** May induce hypertensive syndrome. Use prudently.
- g. If patient does not respond, activate appropriate EMS.
 - h. Designate a recorder to document patient's appearance, vital signs and all treatment given.
2. Nausea/vomiting:
 - a. Hold waste container or emesis basin for patient.
 - b. Make the patient as comfortable as possible. Allow patient to rinse his/her mouth with cold water.
 - c. Instruct the patient to breathe deeply and slowly.
 - d. Apply cold compresses to the forehead and back of the neck if necessary.
 3. Convulsions:
 - a. Prevent the patient from injuring himself or others. DO NOT restrain the movements of the patient's extremities completely, but try to prevent injury.
 - b. Activate appropriate EMS.
 - c. Designate a recorder to document patient's appearance, vital signs, and all treatment given.
 4. Cardiac arrest:
 - a. **CALL FOR HELP.**
 - b. **Call or have someone else call x3-5555. State "cardiac arrest" and give location.**
 - c. Initiate CPR and maintain until cardiac arrest team or physician arrives. Provide assistance as requested.
 - d. Designate a recorder to document patient's appearance, vital signs, and all treatment given.

VII. REFERENCES

- A. Henry, Clinical Diagnosis and Management by Laboratory Methods, 20th, Edition, Pages 8-20, Saunders, PA, 2001.

- B. NCCLS, Procedures for the Collection of Diagnostic Blood Specimens by Venipuncture, Second Edition, Vol. 4, No. 2, Villanova, PA, 1984.
- C. Blumenfield & Slockbower. Collection and Handling of Laboratory Specimens, A Practical Guide, First Edition, Pages 2-35, Lippincott, PA, 1986.

CAPILLARY PUNCTURE BLOOD COLLECTION PROCEDURE

I. MATERIALS

- A. 3.1 mm lancets (finger puncture only)
- B. 2.4 mm point (heel puncture)
- C. Alcohol swabs (silicone impregnated swabs will provide a good "bubble" and better quality collection).
- D. Gauze pad.
- E. Capillary collection containers (Microtainer or equivalent with preservative as specified by test requirements. Plan the number of containers needed from the tests requested).
- F. Disposable latex free gloves
- G. Sharps container

II. PRECAUTIONS

- A. Puncture site must not be edematous, inflamed (as with a rash), or a recently used site.
- B. Puncture must not be more than 2.4 mm deep for heels, or 3.1 mm for fingers. DO NOT use scalpel blades.
- C. Do not puncture the palmar surface of the distal phalanx (finger) of infants and newborns especially premature infants.
- D. Do not apply adhesive bandages to puncture sites on children younger than two years old. Maintain direct pressure until bleeding is controlled.

III. CAPILLARY HEEL STICK PROCEDURE FOR INFANTS

- A. Do not try to obtain blood from the finger of infants, because the bone is so close to the surface which could be injured by the lancet.
- B. Positively identify the infant by the infant's patient identification band which should have the baby's name and complete SSN with prefix. If the band is not on the infant, have the nurse or parents positively identify the infant.
- C. Assemble and prepare equipment.
- D. If desired, the heel can be prewarmed with a warm compress.
- E. Wash hands and put on properly fitting gloves.

- F. Use the sides of an infant's heel. Never use the central portion of the heel because you could injure the underlying bone, which is close to the skin surface at this point. Do not use a previous puncture site.
- G. Clean the puncture site with an alcohol pad.
- H. Dry the cleaned area with dry, sterile gauze. Repeat this step if the area is touched again.
- I. Hold the foot firmly to avoid sudden movement.
- J. Puncture the cleaned site across the skin print lines with a lancet no deeper than 2.4 mm.
- K. With sterile gauze, wipe away the first drop to eliminate skin cell contamination.
- L. If the blood is not free flowing, use gentle pressure to produce a rounded drop of blood. Massaging too heavily will dilute the blood with tissue fluid, thereby falsely affecting the lab test results.
- M. Collect hematology specimens first, followed by chemistry and blood bank specimens. Fill the capillary tubes or microtainers as needed. Be sure to gently shake any microtainers with anticoagulants as the blood enters to prevent clotting.
- N. When finished, elevate the infant's heel. Place a clean, sterile gauze on the puncture site and apply pressure until the bleeding has stopped. Do not use adhesive strips.
- O. Label the specimens with complete name, complete SSN with prefix, date and time of collection, location of where collected, and initials of person collecting the specimen.
- P. Remove gloves and wash hands. Dispose of lancet in sharps container.

IV. **FINGER PUNCTURE**

- A. Finger Puncture (18 months to adult)
 - 1. Finger puncture sites are the center of the distal phalanx on the palmar surface of the finger.
 - 2. Do not perform the puncture on the side or tip of the finger since the tissue thickness in these areas is about one half of that in the center of the finger.
 - 3. Do not puncture deeper than 3.1 mm because the distance from the skin surface to the bone varies from 3.1 mm to 10.9 mm in children.

- B. Prepare the puncture site.
 - 1. Clean the chosen site with a 70% alcohol prep pad.
 - 2. Dry the site with a sterile gauze pad prior to the puncture to prevent hemolysis as the blood contacts the alcohol.
 - 3. Wipe with a sterile silicone impregnated swab (if available).
- C. Prepare the collection containers.
- D. Collection Technique:
 - 1. Grasp firmly for 5 seconds.
 - 2. Puncture the appropriate site with a single, swift "assertive" stroke.
 - 3. Wipe away first drop of blood.
 - 4. Collect the sample by capillary action into the collection container (fill anticoagulant/ preservative containers first).
 - 5. Release pressure for 5 seconds.
 - 6. Follow steps D1, 4 and 5 until the required amount of blood is collected.
 - a. EDTA microtainers require 300 microliters of blood.
 - b. Serum separator microtainers are filled at 900 microliters of blood.
 - c. 0.5 to 1 ml (500-1000 microliters) of blood may be collected from a single puncture.
- E. Stop the bleeding by applying pressure to the puncture site using a sterile gauze pad.
- F. To insure adequate mixing of whole blood with the anticoagulant in microcontainers, flick the microcontainer several times with your finger. Visually inspect the microcontainer to insure adequate mixing.

V. **MISCELLANEOUS**

- A. Sources of Error
 - 1. Improper site selection.
 - 2. Superficial puncture.
 - 3. Inadequate warming of site.
 - 4. Improper collection container for test requested.
 - 5. Contamination and dilution of specimen by tissue fluids due to excess or too vigorous massage of puncture site.
 - 6. Fibrin clot formed from inadequate mixing of specimen with anticoagulant.
- B. Disposal of Contaminated Material. As specified by current infection control requirements.

VI. **REFERENCE**

- A. Bloomfield, Thomas and Stockbower Team. Collection and Handling of Laboratory Specimen - A Practical Guide, pgs 46-54, L.P. Lippincott Co., Philadelphia, PA 1983.
- B. So You're Going to Collect a Blood Specimen: An Introduction to Phlebotomy. Sixth Edition, College of American Pathologists.

BLOOD CULTURE COLLECTION

I. PRINCIPLE

If microorganisms are present in a patient's blood sample inoculated into the BACTEC blood culture sets, carbon dioxide (CO₂) will be liberated into the vial atmosphere as an end product of bacterial respiration. Testing consists of using fluorescence spectrophotometry to measure the amount of CO₂ liberated by the microorganisms. The quantity of CO₂ present in the BACTEC blood culture set is directly proportional to the amount of infrared light absorbed.

II. MATERIALS

- A. 1 aerobic culture vial (blue top).
- B. 1 anaerobic culture vial (purple/violet top).
- C. 70% isopropyl or ethyl alcohol swabs.
- D. Sterile 2" X 2" gauze pads.
- E. Chloraprep® Swabs (1.5 mL 2% chlorhexidine gluconate and 70% alcohol).
- F. Venipuncture set-up:
 - 1. Vacutainer needles.
 - 2. Syringe-type needles, if desired.
 - 3. Syringes, if desired.
 - 4. Butterfly needle/tubing set, if desired.
- G. Tourniquet
- H. Soap
- I. One CHCS order per set of culture vials.
- J. Transport bag (ziplock bag).

III. PROCEDURE

NOTE: If patient is unable to understand the English language, please contact the OOD desk (X3-5008) for an interpreter.

- A. Identify the patient.
- B. Select and prepare venipuncture site.
 - 1. Inspect both arms of the patient for a suitable vein.

Note: The venipuncture site should be free of edema, infection and other skin disorders.

- 2. Place the tourniquet around the patient's arm and select an optimal venipuncture site.

3. Release the tourniquet.
4. Proceed to clean the area as follows:
 - a. Remove a sterile chloraprep applicator from its package grasping the wings, and holding the sponge downward over the venipuncture site.
 - b. Pinch the wings on the applicator to break the ampule and release the antiseptic. Do not touch the sponge.
 - c. Wet the sponge by repeatedly pressing and releasing the sponge against the treatment area until liquid is visible on the skin. Use repeated back and forth strokes of the applicator.
 - d. Scrub for at least 30 seconds using front and back strokes, completely wetting the treatment area with antiseptic.
 - e. Allow the site to dry for at least 30 seconds. DO NOT blot or wipe.
5. If not ready to perform venipuncture immediately, cover the area with a dry, sterile 2" X 2" gauze. If venipuncture cannot be done in less than 2 minutes, the arm must be re-scrubbed.

NOTE: After the skin has been prepared, it must not be touched again. Do not re-palpate the vein at the venipuncture site.
6. Remove the colored flip-off caps from the BACTEC vials and swab the rubber septum with 70% isopropyl alcohol pads **ONLY**. Use different pads for each vial. **The use of iodine will destroy the rubber in the septa.**
7. Apply the tourniquet, visually relocate the intended venipuncture site, and perform the venipuncture. Insert the Blood Culture vials into the vacutainer holder and allow to fill.
8. If a syringe is used, draw enough blood to inoculate each blood culture vial with 8-10 mL of blood. Inoculate the anaerobic culture vial first as it contains a predetermined amount of CO₂ and N₂, which would be altered by the introduction of air.
9. Label each blood culture vial with the patient's name, SSN, location where collected, and time specimen was drawn. Specimen labels must be verified by the patient or another staff member. **DO NOT COVER THE BARCODE LABEL ON THE CULTURE VIALS**. Enter one CHCS order for each complete set.
10. Gently mix the blood culture vials after inoculation.
11. Transport the bottles to the lab promptly to assure viability of any microorganisms present.

C. Dispose of the venipuncture equipment into a closed system biohazardous waste container.

D. Inspect the patient's arm to assure that blood flow has ceased, and then apply a bandage.

IV. **LIMITATIONS**

A. Extreme care must be taken to prevent contamination of the samples during collection and inoculation into the BACTEC vials. A

contaminated sample will give a positive reading, but will not indicate relevant clinical data. Contaminated samples may also hinder and/or hide true blood-borne pathogens.

- B. BACTEC vials are designed to detect in the blood stream the presence of microorganisms. Cerebral-spinal fluids, joint fluids, and any other sterile body fluid will be worked up with a comment indicating the specimen was inappropriately submitted.
- C. Consultation with Infectious Disease has resulted in the following guidelines:
 - 1. 95% to 99% of all septicemias can be detected by collecting 8-10 mL of blood per culture vial three times over a 24-hour period. Each aliquot of blood is inoculated into the anaerobic and aerobic vials in a complete blood culture set.
 - 2. Resin bottles, used for blood cultures while the patient is on antibiotics, cannot be justified either by rate of recovery of the organisms or by expense. Regular blood culture vials may be used for patients on antibiotics by drawing a specimen near the antibiotic(s) trough.
 - 3. Unusual circumstances (i.e., significant change in patient's condition or other need) should be conveyed to the Microbiology Branch at the time of request to substantiate the need for additional blood culture vials.

V. **REFERENCES**

- A. BACTEC Culture Vials Package Inserts, PP-108A and PP105A December 1995
- B. BACTEC 9000 Instrument Manual, Policy and Procedure, Becton Dickinson Diagnostic Instrument Systems, Towson, Maryland; Rev. March 1997 MA-0018 Revision D

INSTRUCTIONS FOR GLUCOSE TOLERANCE TESTS

I. PRINCIPLE

Patients with mild or diet-controlled diabetes may have fasting blood glucose levels within the normal range, but be unable to produce sufficient insulin for prompt metabolism of ingested carbohydrates. As a result, blood glucose rises to abnormally high levels and then return to normal is delayed. A glucose tolerance test, or a glucose challenge, is helpful in diagnosing Type 2 diabetes. Gestational Diabetes is also screened and diagnosed with the glucose tolerance test.

II. POLICY

NOTE: If patient is unable to understand the English language, please contact the OOD desk (x3-5008) for an interpreter.

- A. All tests requiring the administration of a 50g, 75g, or 100g dose of Glucola™ will be preceded by a fasting (or preliminary) glucose level through the collection of a grey top tube. Accucheck Screening prior to administration of glucola for the 2hr and 3hr GTT, must be performed.

For results of fasting Accucheck of 60-149, proceed with the administration of glucola.

Results less than 60 or greater than 149, send the grey top to chemistry for confirmation. If the results are confirmed to be less than 60 or greater than 149, contact the requesting provider for guidance on whether to administer the glucola, document in CHCS the guidance provided by the doctor, date and time of notification and read back.

- B. Patient Reactions to the Procedure
1. The patient will be required to remain in the laboratory waiting area during the duration of the procedure.
 2. The health care provider will be contacted if the patient becomes ill or faint during any special glucose test. A glucose level will be drawn and processed immediately. The health care provider will be notified of the result and will be asked if the procedure should be continued or be rescheduled.
 3. If the patient should experience chest pains or become seriously ill, activate EMS. The health care provider will be contacted and advised of the patient's situation.
 4. The test will be discontinued and the health care provider notified in any case of the patient vomiting prior to completion of the test. The health care provider will decide if the patient is to be rescheduled.

III. PROCEDURES AVAILABLE

- A. One Hour Post Glucose 50g dose:
 - 1. Diabetic screening test for O.B. patients.
 - 2. Patient is not required to be fasting but may per health care provider's instruction.
 - 3. Scheduling with the lab in advance is not required.

- B. Two Hour Glucose Tolerance Test 75g dose:
 - 1. Requires patient to be fasting (8-10 hours) prior to having blood drawn.
 - 2. Scheduling with lab in advance is not required.

- C. Three Hour Glucose Tolerance Test 75g dose:
 - 1. This test is ordered for the diagnosis of Type 2 diabetes.
 - 2. Fasting 8-10 hours prior to testing, and scheduling in advance.
 - 3. Instruct the patient to go to the Outpatient Phlebotomy area for scheduling.

- D. Three Hour Glucose Tolerance Test 100g dose:
 - 1. This test is ordered for the diagnosis of gestational diabetes.
 - 2. Fasting 8-10 hours prior to testing, and scheduling in advance.
 - 3. Instruct the patient to go to the Outpatient Phlebotomy area for scheduling.

- E. Two Hour Post Prandial Profile:
 - 1. Requires two specimens: a fasting and two-hour post prandial.
 - 3. Advanced scheduling with the lab is not required and walk-ins are acceptable if they have been fasting 8-10 hours prior to testing.

IV. **REFERENCE**

- A. Volume 23, Supplement 1, American Diabetes Association: Clinical Practice Recommendations 2000, Screening for Type 2 Diabetes

- B. Volume 21 Supplement 2, Proceedings of the Fourth International Workshop-Conference on Gestational Diabetes Mellitus, The Diagnosis of Gestational Diabetes.

PATIENT PREPARATION FOR GLUCOSE TOLERANCE TESTING

I. POLICY

Please call Outpatient Phlebotomy (3-1623/3-1644) for appointment

NOTE: If patient is unable to understand the English language, please contact the OOD desk (3-5008) for an interpreter.

EAT NOTHING AFTER 2200 (10:00 P.M.) THE DAY PRIOR TO THE TEST. YOU MAY HAVE WATER TO DRINK AND WATER ONLY. DO NOT DRINK COFFEE, TEA OR COLA DRINKS.

DO NOT SMOKE AFTER 2200 (10:00P.M.) UNTIL THE TEST IS COMPLETED.

IT WILL BE NECESSARY FOR YOU TO REMAIN IN THE LABORATORY UNTIL THE TEST IS COMPLETED.

PLEASE ARRIVE AT THE LABORATORY BY 0730 THE MORNING OF THE TEST.

GLUCOSE TOLERANCE TEST: PATIENT'S NAME: _____
 DATE: _____ TIME REPORTED TO LAB: _____

NO SMOKING OR EATING; ONLY WATER AND /OR ICE MAY BE CONSUMED DURING THE TEST! IF YOU FEEL SICK, DIZZY, OR LIGHT HEADED, PLEASE NOTIFY THE TECHNICIAN AT ONCE! IF AT ANY TIME YOU HAVE ANY QUESTIONS, PLEASE FEEL FREE TO ASK.

<u>PERIOD</u>	<u>PHLEBOTOMIST</u>	<u>BLOOD DRAWN?</u>	<u>TIME</u>
FASTING	_____	Y / N	_____
1 HOUR	_____	Y / N	_____
2 HOUR	_____	Y / N	_____
3 HOUR	_____	Y / N	_____
4 HOUR	_____	Y / N	_____
5 HOUR	_____	Y / N	_____

INSTRUCTIONS FOR COLLECTION OF URINE SPECIMENS

I. PURPOSE

To provide guidance for collection and submission of urine specimens for clinical lab tests. For urinalysis to be meaningful, the specimen must be properly collected. Improper collection may invalidate the results of laboratory procedures no matter how carefully and skillfully the tests are performed.

NOTE: If patient is unable to understand the english language, please contact the OOD desk (x3-5008) for an interpreter.

II. PRINCIPLE

- A. The concentration of urine varies throughout a 24-hour period depending partly on the patient's water intake and partly on his activities. Various solutes may appear in greater or lesser amounts at various times of the day (e.g., glucosuria appears more often after meals, proteinuria may occur following activity or assumption of the orthostatic (upright) position, and hemoglobinuria may follow severe exertion). The number of bacteria in the urine of a patient with a urinary tract infection varies greatly throughout the day. In general, a more concentrated urine is preferred for testing rather than a dilute specimen. Therefore, the first morning voided urine, which is the most concentrated, is the best for routine analysis. Often it is not practical to obtain the first morning specimen and a randomly voided specimen of lesser concentration is usually obtained. Therefore, the effect of the concentration of a sample, as measured by the specific gravity, should be considered in the interpretation of the results.
- B. Routine tests and any other tests performed on a random sample of urine are qualitative in nature. At best, only the concentration of a substance in the specimen tested can be measured, but never the total amount being excreted unless the urine is collected over a precisely measured period of time. For example, two random specimens are tested for proteinuria. One may show a heavy concentration of protein and the other only a slight amount. If the first specimen is a very concentrated sample and the second a very dilute sample, the actual total amount of protein may be greater in the second. A 24-hour specimen may provide a more representative sample in these cases.

III. COLLECTION CONTAINERS

- A. Containers used for collecting urine are quite variable. Regardless of type, they must be capable of being cleaned and thoroughly dried before specimens are collected. Without these initial safeguards, test results may be compromised.
- B. Disposable plastic containers are available in many sizes (sterile and non-sterile) and are provided with lids for covering the

specimen to reduce bacterial and other types of contamination. Large, wide-mouthed plastic or glass containers with screw-cap tops are used for cumulative collection of urine over a long period of time. These bottles should be kept refrigerated or should contain an appropriate chemical preservative.

- C. All containers and preservatives for the collection of 24-hour urine will be dispensed by the Laboratory department.
- D. Preservative requirements for 24 Hour Urine.

TEST	REQUIREMENTS
Calcium, Urine	No preservative
Uric Acid, Urine	No preservative
Amylase, Urine	No preservative, Mail out
Creatinine, Urine	No preservative
Glucose, Urine	No preservative
Magnesium, Urine	No preservative
Phosphorus, Urine	No preservative
Urea Nitrogen, Urine	No preservative
Protein, Urine	No preservative

IV. PRECAUTIONS IF URINE IS NOT EXAMINED WITHIN ONE HOUR

- A. Urine kept at room temperature for longer than one hour before analysis will result in deterioration of chemical and cellular elements. Bacterial multiplication regularly occurs in urine specimens that remain at room temperature for over one hour. Bacteria may utilize glucose in the urine, and convert urea to ammonia, producing an alkaline urine. In addition, casts will decompose in urine after several hours, and red blood cells are lysed by hypotonic urine. Marked changes in pH will affect the cellular components.
- B. Refrigeration at 2 - 8°C is often the only precaution needed to preserve the urine for routine analysis. Chemical preservatives may be used when specimens cannot be refrigerated or for certain special collections.

V. TYPES OF SPECIMENS

- A. Routine Urinalysis
 - 1. A freshly voided urine specimen is adequate for most urinalysis except for the bacteriologic (culture and sensitivity) examination. The patient should be instructed to void directly into a clean, dry container and then transfer the specimen into an appropriate container.
 - 2. If a urine specimen is likely to be contaminated with vaginal discharge or menstrual blood, a clean voided specimen must be obtained using the procedures described below.
 - 3. All specimens must be labeled and orders placed in CHCS.

B. Clean Catch/Midstream Specimens

1. These specimens are most commonly used for obtaining urine suitable for bacteriologic examination. Bladder catheterization and percutaneous suprapubic aspiration of the bladder may be used, but only in very rare and unusual circumstances. Collection of a clean voided specimen is the method of choice unless specific contraindications exist. To avoid contamination of the specimen by organisms often harbored normally in the distal urethra, the initial stream of voided urine, which clears these organisms from the urethra, is discarded and the subsequent midstream urine is collected directly into a sterile container.
2. Attachment (1) describes a satisfactory technique for collection of clean catch and midstream specimens for bacterial, fungal, and other urine microbiology specimens from females and should be posted in specimen collection lavatories or provided to each female/ male patient collecting a specimen.

C. 24-Hour Urine Collection

1. A 24-hour urine specimen provides the best representative clinical picture of the patient's metabolic condition.
2. **INSTRUCTIONS:** On the selected morning, empty your bladder and discard this specimen. For the next 24-hours, save all urine voided in a clean container and transfer it to the collection container provided. Try to pass the last sample to be collected at the same hour the collection began. Store the specimen in a cool place, preferably refrigerated, between voids. Return the specimen to the Laboratory as soon as possible after completing the collection.

VI. **DIETARY INSTRUCTIONS**

A. VMA (Vanillylmandelic Acid)

To preclude false elevations of VMA, avoid intake of salicylates (aspirin), caffeine, phenothiazine, antihypertension agents, coffee, tea, chocolate, fruits such as bananas, citrus, and substances containing vanilla for three days prior to and during the collection. If you have any questions regarding the diet or drugs, contact the physician who ordered the test. If you have any questions about the actual collection, contact the Laboratory department.

B. METANEPHRINES DIETARY INSTRUCTIONS FOR 24-HOUR URINE COLLECTION

To prevent false elevations of metanephrines, avoid the intake of caffeine. The following drugs interfere with this test: monamine oxidase inhibitors, **Propranolol HCl** (Inderal), and the diuretic trimterene (Dyazide and Dyrenium). If you have questions regarding the diet or drugs, contact the physician who ordered this test. If you have questions regarding the collection, contact the Laboratory department.

C. 5-HIAA DIETARY INSTRUCTIONS FOR 24-HOUR URINE COLLECTION

To prevent false elevations of urinary 5-HIAA (also known as serotonin) avoid intake of bananas, avocados, plums, eggplant, pineapples, walnuts, alcohol, frozen desserts, meat and poultry skin, and gelatins for three days prior to and during collection. The following medications will also interfere: cough syrup containing guaifenesin, Tylenol (acetaminophen), Emperin (phenacetin), Acetanilid, glyceryl guaiacolate mephensin, methocarbamol, reserpine, chlorpromazine, promazine, imipramine, isoniazid, MAO inhibitors, methenamine, methyldopa, phenothiazines promethazine, or any compound containing these drugs. If you have questions regarding the medication, contact the physician who ordered the test. If you have questions regarding the urine collection, contact the Laboratory department.

- D. CATECHOLAMINES DIETARY INSTRUCTIONS FOR 24-HOUR URINE COLLECTION
To prevent false elevations of catecholamines, avoid intake of all medications including vitamins for three days prior to and during collection. This includes all epinephrine or norepinephrine-like medication, aspirin, vitamin B compounds, alpha-methyl dopa, and "mycin" antibiotics. Omit substances containing caffeine, bananas, chocolate, and vanilla. If you have questions regarding the diet or drugs, contact the physician who ordered this test. If you have questions regarding the collection, contact the Laboratory department.

VII. SPECIAL URINE COLLECTIONS

- A. Catheterization: Performed by provider or nurse (follow patient preparation and submission requirements described above as appropriate)
- B. Suprapubic Aspiration: Performed by provider (follow patient preparation and submission requirements).
- C. Ureter Catheterization: Performed by provider (follow patient preparation and submission requirements)

VIII. REFERENCE

Henry, Clinical Diagnosis and Management by Laboratory Methods, 20th edition, pages 20-24, 412-413, 1323, Saunders, PA, 2001

PATIENT INSTRUCTIONS FOR "CLEAN CATCH" OR "MIDSTREAM" URINE SPECIMEN COLLECTION (MALE/FEMALE)

- I. **Materials (Provided by Lab or Clinic)**
 - A. Labeled sterile cups for culture.
 - B. Labeled urine tubes for routine urinalysis.
 - C. Three pre-moistened antiseptic cleaning wipes.
- II. **Patient Instruction (For best results, the patient should have a strong urge to void.)**
 - A. Wash your hands.
 - B. Remove lid from specimen container. Do not touch inside the lid or container. Set container and lid aside until you collect your specimen.
 - C. **MALE:** Expose your penis as you would to pass urine. Pull back foreskin (if present). Wipe away from the penis opening (urinary meatus) with the first wipe. Throw the first wipe into the trash can. Repeat the cleaning a second and third time with the other wipes. With the foreskin still retracted, pass a small amount of urine into the toilet and stop. Go to Step E.
 - D. **FEMALE:** Sit far back on the toilet. With your index and middle fingers of one hand, hold the layers of skin around the urinary opening apart and keep apart for the rest of the procedure. Take the first cleaning wipe and wipe from front to back (from clitoris towards anus) along one side of the opening. Throw the first wipe in trash can. With the second wipe, clean front to back on the other side. Throw wipe in trash can. Wipe directly across the opening with the third wipe. Throw wipe in trash can. Pass a small amount of urine into the toilet and stop. Go to Step E.
 - E. Take the specimen container and hold it a few inches from you. Urinate and catch the midstream urine. Do not overflow the container. Finish voiding into the toilet.
 - F. Transfer a portion of urine to a plastic bullet tube if directed to do so by reception staff (this is required if there is a routine urinalysis ordered). Close the lid on the container(s).
 - G. Wash your hands. Dress. Return your specimen to the Urine Drop-off window.

INSTRUCTIONS TO PATIENTS FOR 24-HOUR URINE COLLECTION

Note: If patient is unable to understand the English language, please contact the OOD desk (x3-5008) for an interpreter.

Your doctor has ordered a test that requires the collection of your urine for 24-hours. It is very important that the following instructions are followed carefully to insure collection of a good specimen.

1. Read the instructions on the label(s) that were placed on the bottle provided to you by the lab or clinic.
2. Arise at _____ o'clock on _____ (collection date) and empty your bladder in the toilet as you normally do.
3. Afterwards, save all your urine for the next 24-hours, to and including the next morning specimen on (date) _____ at _____ o'clock. That is, save every drop of urine every time you urinate during the 24-hour period.

***DO NOT VOID DIRECTLY INTO THE CONTAINER.**

4. Keep the container with the urine in the refrigerator.
5. Drink 8 to 10 glasses of water during the day you are saving your urine.
6. When the collection is completed, bring the urine container, with the request form attached, to the Laboratory as soon as possible.
7. Make sure that the sample identification tag attached to the bottle has been filled out with your name and social security number with prefix before giving the bottle to the lab.
8. If you have any questions regarding the 24-hour urine collection, please contact the lab at 953-6244. Do not call the lab to ask questions about your condition or your results, only your doctor is authorized to discuss your medical condition.

Thank you for your help and cooperation.

COLLECTION OF FECAL SPECIMENS

I. PURPOSE

To enhance recovery times and detection of parasite ova and trophozoites and preserve other structures in the stool having diagnostic or treatment significance.

NOTE: If patient is unable to understand the English language, please contact the OOD desk (x3-5008) for interpreter.

II. CONTAINER

Obtain a specimen cup from the Laboratory Department.

III. METHOD

- A. Instruct female patients to urinate prior to stool collection due to harmful effects of urine on protozoa if collected in the same container.
- B. The stool must be collected prior to toilet bowel contamination (catch sample before touching the water using a clean paper plate or directly into the collection/transfer container.
- C. Transfer a portion of the sample into the transport cup provided. Care must be taken not to contaminate the outside of the container. Fill the cup **one-half (½)** full and close tightly.

IV. SPECIAL INSTRUCTIONS

- A. Collect stool prior to radiologic studies involving barium sulfate, or one week or longer after use of barium.
- B. Avoid mineral oil, bismuth, nonabsorbable antidiarrheal preparations, antimalarials, and some antibiotics (tetracyclines). Organisms may be difficult to detect for several weeks after medication is discontinued.
- C. A minimum of three fecal specimens on alternate days are recommended to ensure recovery of intestinal parasites and pathogenic bacteria. Number samples consecutively if they are submitted together and note time and date of collection on each.
- D. For the best possible recovery of enteric parasites and pathogenic bacteria, instruct the patient not to refrigerate the specimen(s) unless it is not possible to deliver the specimen(s) within four (4) hours.

BLOOD BANK/TRANSFUSION MEDICINE

I. PURPOSE

To learn the policies and procedures governing the ordering and distribution of blood and blood products, refer to NAVMEDCENPTSVAINST 6530.4 series. The following NMCP Blood Bank intranet site is also a good Resource:

<https://intranet.mar.med.navy.mil/ClinSup/Lab/BloodBank/index.asp>
All Blood Bank request forms and Blood Bank samples (pink top (EDTA) tubes) must be properly labeled, signed, and verified. One form 6530/9, Request for Blood Products, can be used for multiple blood products, if required.

II. REQUESTS FOR THERAPEUTIC PHLEBOTOMIES, AUTOLOGOUS COLLECTIONS, AND APHERESIS PROCEDURES

- A. Hours of Operation: 0700-1530 (Monday to Friday, excluding weekends and holidays). Emergency pager is available.
- B. Requests for Therapeutic Phlebotomies, Autologous Collections, or Red Cell Exchanges, Therapeutic Leukapheresis or Therapeutic Plateletpheresis should be submitted using SF-513 "Consultation Sheet".
- C. Therapeutic **Plasmapheresis** is performed via consultation with Nephrology. For special apheresis procedures (leukocyte or platelet reduction), consult Blood Bank.

III. TIME REQUIREMENTS FOR TEST RESULTS AND BLOOD PRODUCT ISSUE

- A. Emergency Release Red Blood Cells:
 - 1. Emergency group O or Type Specific, Uncrossmatched: within 5-10 minutes after request.

Note: In a bleeding emergency, a provider may order **EMERGENCY RELEASE red blood cells (uncrossmatched)**. The person tasked to call Blood Bank will say: "This is _____ (name) in the _____ (location). I need (number red cells*) by **EMERGENCY RELEASE** for (patient's name & FMP/SSN). Please **SEND THE BLOOD VIA TUBE SYSTEM AT TUBE STATION _____** (if blood is to be tubed). Alternatively state "a runner will pick up the blood".

***Two units are usually issued for adult, one unit for neonate. Please send a properly labeled Blood Bank Sample as soon as possible. Emergency Release Forms must be signed by the ordering physician when The emergency is resolved.**

- B. Type and Screen (T&S):
 - 1. Includes ABO-Rh typing and Antibody screen, for patients who are unlikely to need transfusion. If blood is urgently needed, however, the Type and screen can be "converted" to a

crossmatch and blood units will be available very quickly (within 15-20 minutes).

C. Type and Crossmatch (T&C):

1. Includes ABO-Rh Typing, antibody screen and crossmatch.
2. In patients with an uncomplicated workup, blood can be be available in about 1 hour for STAT orders. The Blood Bank prioritizes its work. Urgent requests are processed ahead of others. If antibodies are present, finding compatible units may take several hours and additional patient samples may be needed. Frozen products require at least 45 minutes for thawing.

D. Samples for T&S or T&C are available for 72 hours: **Exception:** Preoperative patients who have not been transfused or pregnant in the last 3 months may qualify for 14-Day Hold. Contact the blood bank for additional paperwork requirements.

E. Other Blood Products:

1. See NAVMEDCENPTSVAINST 6530.4

III. Rh Immune Globulin (RhIg)

A. Requests for Rh Immune globulin are to be submitted using a 6530/9 Request for Blood Products form, accompanied by a properly labeled and verified pink top tube.

B. Rhophylac® can be administered IM or IV. See the Rhophylac® nursing procedure.

SURGICAL PATHOLOGY SPECIMEN SUBMISSION POLICIES

I. PURPOSE

The information in this manual is provided to show current practices within the Surgical Pathology/ Histology Department. All recommendations and procedures are in agreement with the requirements of the JC and the College of American Pathologists. The following surgical pathology services are offered at NMCP:

- A. Routine surgical pathology processing.
- B. Gross and microscopic examination of tissue biopsies and resection specimens.
- C. Fresh and Frozen section/intraoperative consultations.
- D. Bone Marrow biopsy interpretation.
- E. Special stain and immunohistochemistry analysis.
- F. ER and PgR immunohistochemistry and onsite path interpretation.
- G. Oral pathology.
- H. Dermatopathology.
- I. Hamatopathologr.

II. TISSUE SUBMISSION

Human tissue and foreign material removed in the operating rooms, wards, clinics, and emergency room, with some exemptions as listed below, must be sent to the Histology Laboratory for examination. Instructions for submission of routine tissue specimens follow. Some tissue requires special handling; please refer to the **SPECIAL TISSUE SUBMISSION CONSIDERATIONS PARAGRAPH** of this instruction. **If there is any question regarding appropriate handling of tissue specimens, call Histopathology at ext. 3-1524/1568 for instructions or contact a pathologist. The duty pathologist can be reached at pager 314-8694**

A. ORDERS, LABELING, AND CONTAINER REQUIREMENTS

- 1. **All specimens will be submitted with either a CHCS order entry document or a Tissue Examination Request [NAVHOSPPTSVA 6510/44 (Rev 5/93)],** which must be completely filled out with the provider's full name, the patient's first and last name, social security number with FMP, age, ward/clinic/MOR, specimens anatomic site, two submitting staff's initials, specimen identifier (A, B, C, etc) if more than one specimen is to be submitted, and duty station with phone number for active duty personnel. **When placing the order in CHCS, the ordering provider must verify that the Patient's name, FMP, social security number, date of birth and specimen source on the specimen container are correct.** Specimens from different body sites must be placed in separate, completely labeled, containers.
- 2. The ordering provider must ensure that the specimen container(s) are correctly labeled with complete and correct patient information, including full name, FMP, SSN, and date of birth, and with the correct specimen identifier (A, B, C, etc) and specimen source (body site). **The provider should verify that the specimen identifier(s) (A,**

B, C, etc) and body sites in the orders correspond to the identifier(s) and body sites on the specimen container(s.)

3. Routine specimens should be submitted in 10% neutral buffered formalin fixative. A volume of fixative 10-20 times the volume of the tissue specimen is required for optimal fixation.
4. For ships and branch clinics that mail surgical specimens to Naval Medical Center, Portsmouth, a leak proof screw top container that seals tightly must be used in order to avoid fixative leaking during shipment. Fixative leakage results in inadequate tissue preservation, and histological detail is destroyed.

B. SPECIMEN DELIVERY

1. All specimens should be delivered to the Laboratory by authorized personnel who are trained to handle these specimens properly.
2. During normal working hours (0600-1800, Monday through Friday), specimens should be submitted directly to the Histology laboratory and time stamped on the CHCS order entry document or the Tissue Examination Request NAVHOSPPTSVA 6510/44 (Rev 5/93) upon arrival.
3. Specimens submitted to histology after 1800 Monday through Friday and on weekends and holidays must be submitted to Specimen Processing, Laboratory Medicine Services. The specimen must meet all above specimen acceptance requirements upon arrival.
4. A Histology technician will sign for receipt of specimens between the hours of 0600 and 1800 Monday through Friday. Specimen Processing will sign for receipt of specimens from 1800 to 0600 Monday-Friday and on weekends and holidays. The submitting location is urged to keep a log.

C. SPECIMENS EXEMPT FROM SUBMISSION REQUIREMENT

The only specimens exempt from submission to the histology laboratory are those listed below. With the exception of bullets and missiles, any specimen may be submitted to the laboratory at the discretion of the clinician. Any specimens not submitted to the laboratory should be clearly described and documented in the clinical record.

1. Bullets and other missiles should be maintained with a chain of custody form and given directly to Security for legal purposes.
2. Teeth, liposuction contents, inter-vertebral disc material, and infant prepuces need not be submitted.
3. Grossly normal placentas need not be submitted. Submission of placentas is at the discretion of the Obstetrics and Gynecology department.

4. Orthopedic devices and foreign bodies need not be submitted but should be clearly documented in the clinical record if not submitted.

D. SPECIMENS EXEMPT FROM MICROSCOPIC EXAMINATION.

1. Medical devices, including orthopedic hardware and foreign bodies are submitted for gross diagnosis only. In the case of serialized medical hardware, the manufacturer and serial number will be included in the pathology report.
2. Some tissue specimens, such as traumatic amputations, and grossly normal tonsillectomy specimens from children under 12, may not require microscopic examination. The pathologist responsible for the case will determine at the time of gross examination whether supplementary microscopic examination is indicated.

III. SPECIAL TISSUE SUBMISSION CONSIDERATIONS

A. Bone marrow aspirates with bone biopsies.

Contact the clinical hematologist or Special Hematology x 3-1577 for further information and scheduling.

B. Breast tissue.

All Breast tissue must be submitted with a formalin fixation sheet.

1. Needle core/mammotome biopsies:

Submit in an appropriate amount of formalin. For biopsies performed for calcifications, a specimen radiograph should accompany the specimen.

2. All other breast tissue specimens, (including those requiring radiologic examination, such as wire directed biopsies):

Submit without fixative. Specimens should be delivered to the histology laboratory as quickly as possible in order to be examined by a pathologist and must be transferred into formalin in under 1 hour. This ensures that tissue requiring hormone receptor assays and gene amplification studies is handled in accordance with current formalin fixation guidelines for those studies. If a specimen radiograph is available, the radiograph should accompany the specimen.

C. Cone biopsy of cervix:

1. Prior to placing the tissue in formalin, the surgeon should open the specimen at the anterior midline (twelve o'clock position) of the cervix and indicate such with a suture.
2. After this, pin the specimen flat on a tongue depressor and place in 10% neutral buffered formalin.

D. Eyeballs:

Naval Medical Center Portsmouth does not have an Ophthalmologic Pathologist. Complex ocular specimens will receive extra-

departmental evaluation. Contact the duty pathologist at pager 314-8694 to discuss the case prior to the surgery.

1. Submit in 10% neutral buffered formalin

E. Kidney Biopsies for non-neoplastic kidney disease:

Kidney Biopsies for non-neoplastic kidney disease are sent out to a reference lab for diagnosis. The Nephrology department must notify the Histology department at 953-1523 at least 24 hours in advance of the biopsy in order to coordinate technical support for biopsy collection to ensure proper handling. Be prepared to provide the date, time and location of the biopsy. Three Biopsies should be submitted in three different fixatives for a complete evaluation.

1. Complete the **Renal Biopsy Registry Sheet** that will accompany the specimen.
2. When available, the reference laboratory's report is transcribed into COPATH.

F. Lymph nodes:

1. **Lymph nodes submitted to rule out metastatic carcinoma**, including sentinel nodes, can be submitted in formalin. Sentinel nodes must be clearly labeled as such.
2. **Lymph nodes submitted to rule out lymphoma** should be sent to the histology laboratory without fixative. Coordination with the pathologist responsible for the case, in advance of the surgery, is encouraged in order to prioritize allocation of tissue for various studies based on the clinical scenario. **Please contact the Histology department at 953-1526 or 1527, or contact the duty pathologist at pager 314-8694, and ask to speak with the Pathologist on Frozen Sections for the day the biopsy is to be taken.** The pathologist will determine what studies are indicated based on the clinical findings. Touch preparations, frozen section examination, immunophenotype by flow cytometry, and molecular studies will be performed as indicated. A full lymph node protocol generally requires at least one cubic centimeter of tissue. Less material will result in "trriage" of tissue with some studies left out.
3. If an infectious process is suspected, additional material should be submitted whenever possible in a separate sterile container with the appropriate tissue culture requests completed.

G. Testicular biopsy for Infertility:

Bouin's solution is the fixative of choice and can be acquired prior to the biopsy by notifying Histology at Ext. 3-1526, 1527.

H. Uterus:

1. Expose the endometrial cavity along its entire course prior to fixation by opening along the lateral margins (bivalving) along a forceps or probe inserted into the endometrial canal. The entire uterus should be covered by formalin.
2. Those specimens submitted to rule out or stage malignancy should be submitted without fixative and unaltered. Any sectioning should be done by the pathologists after surgical removal of the specimen.

I. Muscle biopsy:

1. Contact the histology section at 3-1523, 1526, or 1527 or the duty pathologist at pager 314-8694 as far in advance of the procedure as possible, at least 48 hrs, to coordinate tissue submission.
2. Three or four pieces of muscle should be received in separate containers labeled A, B, ETC. (Two pieces in clamps and one piece not in clamp for snap freezing for AFIP; one piece not in clamp to be snap frozen for ATHENA if requested).
3. Specimen must arrive in the histopathology department fresh/unfixed and **not in saline**. Freezing tissue that is in saline will compromise diagnostic value of the biopsy.
4. The specimen must arrive in the histopathology department within 10 minutes of it leaving the operating room.

I. Mucosal and skin biopsies for **Direct Immunofluorescent studies:**

Skin or mucosal biopsies obtained for Direct Immunofluorescent (DIF) studies are mailed to a reference laboratory for processing and evaluation. These biopsies require special fixative and should not be placed in formalin.

1. Pick up the request form and required fixative (Michel's solution) from histology prior to collection the specimen.
2. A completely filled out reference laboratory request and SF15 or printed CHCS order must accompany the specimen.
3. Place the biopsy in the tube of fixative and label it with the patient information and specimen source.
4. Deliver the completed request and the specimen to the lab. Call Ext. 3-1524 for further information.

J. Nerve biopsy:

1. Contact the histology section at 3-1523 or 1526 or the duty pathologist at pager 314-8694 as far in advance of the procedure as possible, at least 24 hrs, to coordinate tissue submission.

2. The neurologist, neurosurgeon and/or clinician requesting the tissue evaluation must provide complete patient history.
 3. Collect a 1.2 to 2.0cm nerve biopsy.
 4. Label the proximal end of the nerve and place in a sterile screw top container.
 5. **Do not place the specimen in formalin, wrap in gauze or place in saline.**
- L. Bronchial biopsy and/or open lung biopsy in immunocompromised patients designated for GMS stain, AFB, and Legionella workup:
1. Notify Histopathology as soon as procedure is anticipated.
 2. Specially trained laboratory personnel must process open lung and bronchial biopsies. Biopsies done during the first part of a normal working day can be processed expeditiously. Biopsies done in the late afternoon, evenings, and weekends require coordination. Advanced notification of an anticipated open lung or bronchial biopsy allows more time to plan for optimal technical support to handle these important biopsies.
 3. If microbiology testing is desired the biopsy specimen must be submitted fresh.
- M. HIRSCHSPRUNG'S PROTOCOL:
Submucosal suction biopsies of colon. Four biopsies, two from 2cm and two from 4cm above the pectinate line should be submitted for optimum diagnostic results. Lesser amounts will be processed, with priority to formalin fixed sections if insufficient tissue is available to accomplish the entire protocol.
1. One biopsy from each level should be submitted fresh, placed on a saline moistened Telfa pad or paper towel for freezing and one should be in 10% formalin.
 2. Specimens must be **immediately** (within 10 minutes of collection) delivered to histology to minimize deterioration and drying of the fresh tissue.
- N. Any tissue which requires special handling procedures:
1. Consult a pathologist **before the** procedure. The duty pathologist can be reached at pager 314-8694.
- IV. **SUBMISSION OF TISSUE WITHOUT FIXATIVE (FRESH), INCLUDING TISSUE FOR INTRA-OPERATIVE CONSULTATION:**
- A. It is desirable, when possible, for the surgeon to consult with the pathologist prior to intra-operative consultation. This will ensure that all appropriate diagnostic aids (special fixatives, imprints, cultures, x-ray findings, etc) are available at the time the specimen is delivered to the histology laboratory.
- B. Intra-operative examination(s) may be scheduled in advance by consultation with a pathologist or by placing "F.S." or "Frozen Section" on the operative schedule. If a request for intra-

operative consultation is anticipated outside of normal working hours (0600-1800) Monday - Friday, on weekends or Holidays, prior co-ordination with the duty pathologist, pager 314-8694, is required.

- C. A completed TISSUE EXAMINATION REQUEST [NAVHOSPPTSVA 6510/44 (Rev 5/93) or Essentris TISSUE EXAMINATION REQUEST indicating the need for intra-operative consultation with appropriate history and request should accompany all requests for frozen sections. The request form must have written indications of the studies requested. If not so indicated, specific studies needed may not be done.
- D. It is the responsibility of the OR runner to deliver all fresh tissue specimens and tissue exam sheets or CHCS order entry document to the Histology branch within 10 minutes of departing the OR. Fresh specimens for intra-operative examination and Culture may also be submitted via the Pneumatic Tube System (See NAVMEDCENPTSVA INST 11301.1C). If cultures are requested, the tissues should be submitted with the appropriate culture request forms. During the hours of 0600-1800, Monday through Friday, all tissue specimens submitted without fixative are to be delivered directly to Histology and given to a histology technician. In the event that cultures are also requested on the tissue specimen, the OR runner still must deliver the fresh specimen to Histology.
- E. If the entire specimen is for culture only, and no tissue examination is requested, the sterile specimen can be submitted directly to the Microbiology section and the microbiology staff will culture the entire tissue specimen.
- F. During the hours of 1800-0600, Monday through Friday, and on Saturday, Sunday and holidays, specimens should not be delivered without fixative unless the duty pathologist (pager 314-8694) has been consulted. If fresh specimens are delivered outside of normal working hours, or in the event a histology technician cannot be located, the OR runner will deliver them directly to the Specimen Receiving desk. The Laboratory Technician will sign for the fresh tissue specimen and immediately notify the duty pathologist that there is a fresh tissue specimen for examination
- G. Intra-operative consultations that are scheduled and then canceled should be promptly reported to Histology branch.

NOTE: Specimens consisting chiefly of mature adipose tissue do not process well for frozen sections. In some cases, the pathologist may have to forego frozen section of adipose tissue in favor of formalin fixation.

Note: Considerable risk and unnecessary exposure attends the dangerous and unwarranted process of opening lung lesions in the operating room. Surgical masks offer inadequate protection in this circumstance. Additionally, inadequately prepared

microbiological cultures often result and unsuspecting laboratory personnel are unnecessarily exposed. Therefore, it is requested that the intact specimen be sent to the Laboratory in sterile saline-moistened gauze in a sterile container. A Tissue Examination Request Form and Culture Request Forms for mycobacteria, fungus, and bacteria should accompany the specimen. The pathologist will examine the lesion and divide it for culture and histopathology. Granulomata will not be processed for frozen section, as recent reports have emphasized the danger of this procedure (MMWR 30:73). Report of the quick stains for organisms as well as the H&E touch preparations, although not definitive, will be made via routine frozen section reporting channels.

H. All specimens submitted from patients with suspected airborne infectious diseases (e.g.: TB, etc.) must be so identified.

V. **REQUESTS FOR SURGICAL PATHOLOGY MATERIAL FROM OUTSIDE INSTITUTIONS:**
On request, the Laboratory's Administrative Assistant will prepare and mail the proper correspondence requesting loan of surgical and autopsy material pertinent to management of patients hospitalized at NMCP. Medical officers desiring such services must make available as much detailed information as possible concerning the exact location and date of the patient's prior hospitalization and may require a signed patient consent. The laboratory secretary can be reached at X3-1712.

VI. **TRANSMISSION OF SURGICAL MATERIAL TO OTHER HOSPITALS**
It is sometimes necessary to send surgical pathology material obtained from patients at NMCP other hospitals that the patient has been transferred to for continuation of medical care. All such requests must be forwarded by the Laboratory's Administrative Assistant for processing. In exceptional cases, the patient will be allowed to hand carry the requested material together with a copy of the final report to the medical facility providing additional medical care.

VII. **REVIEW OF SURGICAL MATERIAL**
Physicians are encouraged to visit Histology to review with the pathologist microscopic slides prepared from the tissue that they have submitted. Times may be arranged by contacting the responsible staff pathologist in advance.

VIII. **DISCARD OF GROSS SURGICAL SPECIMENS**
Surgical tissue is periodically discarded from Surgical Pathology. This process occurs only after a given specimen has been held at least two weeks from the time the case is signed out. Specimens may be held for longer periods of time (in the event of interest, need or for medico-legal purposes). Orthopedic hardware implants, etc., that are not requested for return by the physician and/or patient will be retained for two weeks unless required for other purposes. Non-tissue material requested to be saved by patients will be held for two weeks. Patients must retrieve the indicated non-tissue specimens. For safety reasons tissue must not be given to a patient.

IX. **TECHNICAL PROBLEMS WITH SURGICAL SPECIMENS**

Rarely, during the processing of tissue in the histology laboratory, unforeseen technical problems may arise that will render the tissue unsuitable for microscopic diagnosis. In those situations, the pathologist concerned will notify the clinician who performed the biopsy (or appropriate clinical staff if the clinician is not available) by telephone as soon as the problem is discovered. The completed report will include documentation of the telephone conversation in the "comments" section of the surgical pathology report.

MORGUE AND AUTOPSY POLICIES

- I. AUTOPSY PATHOLOGY SERVICES OFFERED AT NMCP:
 - A. Medical autopsies with signed consent as requested.
 - B. Forensic autopsies through the Regional Armed Forces Medical Examiner as required.
 - C. Dissection and tissue processing.
 - D. Microscopic evaluation of autopsy material.
 - E. Processing in support of off-site medical examiner cases.

- II. MORGUE POLICIES:
 - A. Preparing the body for Morgue Admission:
 1. Adult:

Complete 3 Deceased Remains Tags, NAVMEDCEN 5360/3 (Rev. 8/95) by completely filling out the tags with the patient identification, Rank/Rate, SSN, Status, Date of Death, Time of Death, Clinic, Diagnosis, Providers name and providers/charge nurse signature on each tag. This information may be handwritten on each tag or a computer generated label containing the information may be applied to each tag to identify the remains. Attach one tag to the right wrist, one to the right great toe of the remains. (Always use universal Precautions in handling body). The remains should come to the morgue placed in a body bag and an Deceased Remains Tag must be placed on the outside zipper of the body bag. A gurney sheet should be placed over the body and the body can then be transported to the morgue. The ward of clinic may borrow a covered gurney so it is not obvious to patients that a patient has passed.

 - a. Autopsy Authorization Signed:

When a body is presented to the morgue (for autopsy) do not remove tubes, IV's, drains or anything else from the remains. Tie a knot or clamp all tube endings to secure them in place and prevent leakage of body fluids.
 - b. No autopsy is requested:

Remove all tubes, IV's, drains or anything else deemed appropriate will be removed from the remains on the ward. Remains should be cleaned/washed in preparation for release to the funeral home by ward staff.
 2. Infant/Fetus:

Any ID bracelets or tags put on the infant on the ward should be left in place.

Complete 3 Deceased Remains Tags, NAVMEDCEN 5360/3 (Rev. 8/95) by placing the patient identification on each tag. The patient identification information may be handwritten on each tag or a computer generated label may be applied to each tag to identify the remains. Attach one tag to the right wrist and one to the right great toe of the remains. (Always use universal precautions in handling body). The remains should come to the morgue placed in a body bag and

an ID tag should be placed on the outside zipper of the body bag. The infant should be transported to the morgue wrapped (covered) in a blanket or chux either in a basket or infant crib. Under no circumstances should deceased fetuses or infants be carried to the morgue.

a. Autopsy Authorization Signed:

When the remains of an infant or fetus is presented to the morgue do not remove tubes, IV, drains or anything else from the remains. Tie a knot or clamp all tube endings to secure them in place and prevent leakage of body fluids.

If not autopsy then the tubes should be removed on the ward. Bodies should be bathed.

b. No Autopsy is requested:

Remove all tubes, IV's, drains or anything else deemed appropriate should be removed from the remains on the ward. Remains should be cleaned/washed in preparation for release to the funeral home.

II. AUTOPSY POLICY:

A. BACKGROUND:

1. Definition: An autopsy is a postmortem examination performed by a pathologist to:
 - a. Determine the cause and manner of death.
 - b. Explain and/or confirm clinical findings and impressions.
 - c. Evaluate the effectiveness of antemortem therapy.
2. As such, the autopsy functions as a teaching device for clinicians and clinical support staff, and serves a quality improvement function for treatment rendered in the hospital.

B. POLICY:

1. Permission for Autopsy
 - a. Manual of the Medical Department, Chapter 17-18 and NAVMEDCENPTSVAINST 5360.1C should be consulted for details concerning the proper handling of deaths and related matters. The Decedent Affairs Office is available for assistance at Ext.3-2617. IT MUST BE REMEMBERED THAT AN AUTOPSY WILL NOT BE PERFORMED UNLESS A VALID AUTOPSY PERMIT IS COMPLETED. IT IS THE RESPONSIBILITY OF THE ATTENDING PHYSICIAN TO ENSURE THAT THIS CONSENT HAS BEEN PROPERLY OBTAINED AND DOCUMENTED.
 - b. In the case of dependents, retirees, and civilians, permission to perform an autopsy at Naval Medical Center Portsmouth must be obtained from the deceased's primary next of kin (NOK). This permission cannot be granted before death occurs. In addition, any powers-of-attorney that may have been granted to anyone else are voided upon death and the authority to grant permission for an autopsy reverts

to the primary NOK. The Decedent Affairs Office can render assistance in determining the identity of the primary next of kin.

- c. Permission for an autopsy is obtained using SF523. The consent must be obtained by a physician, and this physician, plus at least one other staff member, must sign the form as witnesses. It is imperative that the family member be apprised of the nature of the autopsy (i.e., informed consent obtained) and their desire for any limitations of the autopsy be determined (i.e., head only, chest only, etc.). If such limitations are desired, they must be described in the appropriate place on the SF523. If no limitations are desired, then "NONE" must be written in that space. The form must have the appropriate date and time, and the relationship of the person signing the form to the deceased must be listed. The absence of any of the above will cause the permit to be invalid and the autopsy delayed while these discrepancies are rectified.
- d. For Active Duty Deaths, permission for an autopsy can be granted by OAFME, the Office of the Armed Forces Medical Examiner (located in Rockville, MD; phone number-301-319-0000) or the member's Commanding Officer. The NOK is typically not approached for permission to perform an autopsy in the case of active duty deaths.
- e. For all deaths in which the manner is other than natural (homicides, suicides, accidents) and in all pediatric deaths, the Regional Armed Forces Medical Examiner should be contacted to discuss any potential medicolegal issues. **Non-natural deaths which occur in NMCP fall under the jurisdiction of the Tidewater Office of the Chief Medical Examiner of the State of Virginia (TOCME).** These cases must be released by the Medical Examiner prior to autopsy or other disposition of the body, either by contacting the OAFME, or by contacting the Virginia Medical Examiner directly at 683-8366.
- f. Although it is recommended that a request for autopsy be made on every death, it is recognized that performing an autopsy on every death may not be possible. Deaths in which an autopsy should be especially encouraged are as follows:
 - 1) Deaths in which the cause is uncertain on clinical grounds or when there are unexplained medical complications.
 - 2) Cases in which autopsy may help allay concerns and provide reassurance to the family and/or public concerning the deaths.
 - 3) Deaths occurring during or following diagnostic or therapeutic procedures.
 - 4) Death of patients participating in clinical trials.

- 5) Apparently natural deaths of sudden, unexpected or unexplained nature either waived by or not subject to a forensic medical jurisdiction such as:
 - a) Persons dead on arrival at a hospital
 - b) Deaths occurring within 24-hours of hospitalization
 - c) Deaths of patients apparently injured while hospitalized.
- 6) All neonatal, pediatric, and obstetric deaths.
- 7) Deaths arising from high-risk infections or contagious disease (see below).
- 8) Deaths involving transplant patients.
- 9) Deaths suspected as due to environmental or occupational hazards/accidents.
- g. In Deaths Involving Radioactivity, the Radiation Safety Officer must be notified and NAVMEDCENPTSVA INST 6470.2C pertains. These cases are generally discouraged for autopsy due to risk to laboratory personnel.
- h. Cases involving suspected Creutzfeld-Jacob Disease (CJD) or other spongiform encephalopathies are typically limited to internal examination of the head only. Consultation should be sought with the Head, Autopsy Service at the earliest possible point so that adequate planning and preparation can occur.

2. Fetal Autopsies

- a. As defined in the Code of Virginia (Section 32.1-249), fetal death means death prior to the complete expulsion or extraction from its mother of a product of human conception, regardless of the duration of pregnancy; death is indicated by the fact that after such expulsion or extraction the fetus does not breathe or show any other evidence of life such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles.
- b. It is the policy of the laboratory that fetuses are to be handled in accordance with the wishes of the parents, and that the wishes of parents be determined prior to any invasive examination. Autopsies are frequently very useful as a means of delineating congenital defects and other problems, which may have resulted in an intrauterine fetal demise. An autopsy is also extremely helpful in order to document the absence of any discernable heritable anomalies and thereby allay parent's fears. However, it must be remembered that an autopsy is an invasive procedure and as such, will not be performed without the express permission of the parents. With these considerations in mind, the following policies are in effect for fetuses greater than or equal to 20 weeks gestational age and/or 500 grams in weight:

- 1) If an autopsy is desired by the parents, a standard autopsy permit must be signed as described above. It is not necessary that both parents sign. The fetus and placenta should be transported to the morgue along with the autopsy permit and a copy of the inpatient chart.
 - 2) If no autopsy is desired, no permit is submitted, and/or the fetus is less than 20 weeks/500 grams, the fetus will receive a gross (external) examination only, with anthropometric measurements made. This external examination will be reported in a surgical pathology report.
 - c. It is important to contact the Decedent Affairs office when a fetal death has occurred, so that they can assist with counseling parents on disposition options.
 - d. It will occasionally be the case that fetal tissue will only be recognized after examination in the laboratory. In these cases, the laboratory will contact the Decedent Affairs office, which will in turn then contact the parents to discuss disposition options.
3. Performing of Autopsies
- a. Scheduling (Except as directed by the Laboratory Director or duty pathologist): Routine autopsies are performed **5** days a week, Monday through Friday, during normal working hours. Generally, autopsies will not commence after 1400. Autopsies which will require performance at night or on weekends because of special circumstances may be arranged by contacting Pathology during regular working hours or the duty pathologist in the evening or on weekends.
 - b. Submission: All information, including valid authorization, in-patient and out-patient records, results of investigations, and circumstances surrounding death must be delivered to Decedent Affairs and be available to the pathologist before an autopsy will be performed. The pathologist must be informed of any known hazards to performing the autopsy, specifically including, but not limited to, infectious diseases and radioactive contamination. Except in special cases determined and indicated by the pathologist, remains will be prepared and transferred to the morgue as described in NAVMEDCENPTSVAINST. 5360.1 series.
4. Miscellaneous considerations
- a. Any person involved in the care of the patient may observe an autopsy if the Head, Autopsy branch is consulted and gives permission. NMCP students, interns, residents and staff may observe autopsies at the discretion of the pathologist performing the autopsy. **The attending physicians and the remainder**

of the ward team are encouraged to attend autopsies on their patients as their schedules permit.

- b. There are no appropriate facilities within the morgue for the viewing of remains by family members. Therefore, after the remains have left the ward and been admitted to the morgue, they will not be available for viewing by the family until they have reached a funeral home of the family's choosing. In addition, the remains cannot be transported to any other area of the hospital once they have been admitted to the morgue. There are no exceptions to this policy.
- c. A Provisional Autopsy Report should be issued within two (2) working days of performance of the autopsy. The completed autopsy protocol must be completed within the time period specified in the medical staff bylaws, which is currently one (1) month (or 30 working days) for routine autopsies and three (3) months for complicated cases unless there are special studies pending or unusual circumstances. Complicated autopsy cases are defined as those that require additional testing or consultation beyond routine gross and microscopic analysis. Examples include the following, but are not limited to these: toxicology, external consultation, immunopathology and microbiology studies.

CYTOLOGY GENERAL INFORMATION

I. PURPOSE

To provide general information on policies and procedures to be followed when submitting specimens for cytologic examination. The following cytopathology services are offered at NMCP:

- A. Cytologic examinations for GYN and Non-GYN specimens.
- B. Fine needle aspiration procedures in the laboratory dept by appointment (953-1623).
- C. Fine needle aspiration technician on call for clinic and bedside procedures during normal working hours scheduled through the cytology dept (953-1744).

II. INTRODUCTION

It is the endeavor of the Cytology team to provide the most accurate cytologic evaluation possible. Each staff member can assist Cytology in performing this task by ensuring that specimens are correctly labeled and that all portions of the proper requisition chits are completely and accurately filled out. Pertinent clinical history, including any chemotherapy or radiotherapy, is essential for precise cytologic interpretations.

III. GENERAL INFORMATION

A. LOCATION AND HOURS

1. Cytology is located in the Laboratory, Building 2 at the NAVMEDCENPTSVA compound. The processing room telephone number is 953-1667, and the screening room is 953-1744/1745. Normal operating hours are 0730 - 1600, Monday - Friday.

B. CYTOLOGY REQUEST FORMS

1. A request for GYN or NON-GYN cytology evaluation constitutes a request for a clinical consultation by the Laboratory department, and should be submitted in accordance with standards appropriate for professional consultations.
2. The following are the only acceptable forms for requesting cytologic evaluations:
 - a. CHCS specimen order entry.
 - b. Gynecological Exfoliative Cytology Examination, Form NAVMEDCENPTSVA 6510/3 (Rev 3/00)
 - c. Non-GYN Cytology Examination, Form NAVMEDCENPTSVA 6510/4 (New 9/83)
3. These forms are available from NAVMEDCEN Forms Control. These forms provide space for patient's name, age, sex, race, FMP and social security number, date, submitting activity, specimen source, clinical history and clinician's signature. ALL OF THE REQUESTED DATA MUST APPEAR ON EACH CHIT SUBMITTED in accordance with Standards for Laboratory Inspection and Accreditation, College of American Pathologists. The

cytologic report will be entered into CHCS after results are certified.

4. All appropriate blocks on the form should be filled in using a ballpoint pen (do not use a marker or pencil). All items pertaining to patient and specimen identification are required by laboratory and accreditation standards. These include complete and legible name, SSN with FMP, facility or ward and/or submitting physician's name, and source and nature of specimen. The patient's age, hormonal status, clinical history, last menstrual period (LMP), treatment (hormonal, chemotherapy, radiation, etc.) are necessary for accurate interpretation of PAP smears.
5. If a biopsy was obtained at the same time as the cytologic specimen, please note on the request form so that a cytologic/histologic correlation may be reported.

C. CYTOLOGY REPORT AND GYN CLASSIFICATION CODE

1. The definitive report for any cytologic specimen is reported in CHCS. This report is the written interpretation of the Cytology Team.
2. The diagnostic report includes:
 - a. Statement of adequacy.
 - b. Descriptive diagnosis.
 - c. Any recommendation for follow-up.
3. Reporting of GYN Cervical/Vaginal Cytology conforms to the format and terminology of the Bethesda System (2001).

D. THE 2001 BETHESDA SYSTEM FOR REPORTING CERVICAL/VAGINAL CYTOLOGICAL DIAGNOSES

The Bethesda System (TBS) for Reporting Cervical/Vaginal Cytological Diagnosis has been the national standard since it was drafted in 1988. This nomenclature was modified in 1991 and again in 2001. All gynecologic cytology reports issued by Cytopathology, Naval Medical Center, Portsmouth, Virginia will be modified to reflect the latest version of TBS.

Most of the changes are minor, self-explanatory edits that add clarity to the report. There are two (2) main sections to the revised report format:

Specimen Adequacy. (There are only two choices)

1. Satisfactory for evaluation. The phrase "satisfactory but limited by...blood, inflammation, etc." has been eliminated.
2. Unsatisfactory for evaluation. This category includes cases that have been rejected (e.g., incorrect name or SSN) and **NOT** evaluated; and those cases that have been fully screened and determined to be unsatisfactory due to other factors (e.g., obscuring inflammation).

Descriptive Interpretation/Diagnosis.

1. Negative for Intraepithelial Lesion or Malignancy- replaces the phrase "Within Normal Limits."
2. Epithelial Cell Abnormality- Squamous Cells.

- a. Atypical Squamous Cells of Undetermined Significance (ASCUS).
 - b. Atypical Squamous Cells of Undetermined Significance, a High Grade Squamous Intraepithelial Lesion cannot be excluded (ASCUS-H).
 - c. Low Grade Squamous Intraepithelial Lesion (LSIL).
 - d. High Grade Squamous Intraepithelial Lesion (HSIL).
 - e. Human Papillomoma Virus (HPV) - results to be listed as "Detected" or "Not Detected".
 - f. Squamous Cell Carcinoma (SCCA)
3. Epithelial Cell Abnormality- Glandular Cells.
 - a. Atypical Endocervical Cells.
 - b. Atypical Endometrial Cells.
 - c. Atypical Glandular Cells.
 - d. Atypical Glandular/Endocervical Cells, Favor Neoplasia.
 - e. Endocervical Adenocarcinoma In-Situ (AIS).
 - f. Adenocarcinoma, Endocervical.
 - g. Adenocarcinoma, Endometrial.
 - h. Adenocarcinoma, Not Otherwise Specified (NOS)
 4. Other Malignant Neoplasms (specify)

More detailed information is available at the following websites:
<http://jama.ama-assn.org/current.dtl>

E. ABNORMAL REPORTS

1. Those GYN reports that are suspicious or positive for carcinoma are telephoned to the physician or other health care provider submitting the specimen. Phone calls are made to outlying commands. Non-GYN reports that are suspicious or positive for carcinoma are handled in a similar fashion when warranted.
2. The original reports will then be available in CHCS.
3. Smears that are UNSATISFACTORY due to technical factors should be repeated. Repeat smears may also be requested for smears classed "sub-optimal". The repeat smear should be obtained no sooner than 10 weeks after the original smear.
4. Smears with inflammatory changes and identifiable infectious agents may be recommended for treatment followed by a repeat smear, again at an interval of about 6 month-12 months. Repeating the smear at an earlier interval may increase the likelihood of a false-negative study (the epithelium may be incompletely regenerated).
5. The NMCP Cytology Laboratory will support the American Society for Colposcopy and Cervical Pathology (ASCCP) consensus guidelines for the management of women with abnormal Pap smears. All Thin-prep specimens with an initial diagnosis of ASCUS will have a "Reflex" HPV DNA test performed on patients over 21 years of age. Results of the HPV DNA test will be reported in an addendum to the Pap smear report that triggered the testing.

For more detailed information on the ASCCP Guidelines and HPV DNA Test, please refer to the following websites:
<http://www.asccp.org>

<http://www.digene.com/index.html>

F. SUBMISSION OF SPECIMENS

1. During normal working hours, cytology specimens will be brought to Specimen Receiving, Bldg 2. After hours, they will be turned over to the Senior Laboratory Technician (pager 314-8445).
2. All Conventional Pap smears are made on slides. Every slide must be labeled with the patient's last name, first initial, family member prefix and the last four digits of the sponsor's social security number on the end of each slide. This identification should be written in soft lead pencil (ink will wash off during processing). If plain slides must be used, the patient's identification data must be etched on one end of each slide.
3. All non-GYN specimen containers must be clearly labeled with the patient's identification data as outlined above. In addition, the following information must also be included on the chit:
 - a. Date and time of collection.
 - b. Specimen source.
4. If a body fluid specimen cannot be brought immediately to the cytology processing room, it must be refrigerated, and brought to the Laboratory as soon as possible.
5. All glass slides submitted in 95% ethyl alcohol must be clearly labeled.
6. Glass slides should be labeled prior to obtaining the specimen.
7. Any delay in fixing specimens placed on glass slides will cause drying artifacts that hinder cytologic evaluation.
8. Special considerations for each type of specimen are to be outlined in the appropriate section for each type of specimen.

G. REJECTION/RETURN OF CYTOLOGIC SPECIMENS

1. Accurate patient and specimen identification is critical. Complete and legible information is required on all forms, and slides must be properly labeled. Missing or incomplete information on the Cytology request forms is cause for return of the specimen and form for correction. Unidentified specimens are cause for rejection. Double-checking specimens and forms prior to submission can avoid most refusals or specimen returns. PAPER IDENTIFICATION LABELS ON SLIDES ARE UNACCEPTABLE.
2. Bloody or body fluid contaminated forms will not be accepted.
3. The cytology staff will make every effort to accession and process these specimens to avoid any delay while corrections are being made.
4. Specimen rejection is necessary in order to provide an accurate evaluation and to insure that a specimen belongs to the intended patient. These requirements comply with the standards of the College of American Pathologists.

H. SPECIMEN FIXATION

1. GYN smears shall be fixed with "Cytology Fixative" available through NAVMEDCENPTSVA supply or directly from Surgipath Medical Industries, Inc., 1440 Paddock Drive, Northbrook, Illinois 60062. An alternative is immediate submersion and submission in 95% ethyl alcohol. Slides should be labeled prior to obtaining the specimen.
2. Non-GYN smears should be fixed immediately in 95% ethyl alcohol. This is available from the cytology processing room (room 85).
3. Other non-GYN fluid specimens will be submitted unfixed. They should be brought to the cytology processing room without delay.
4. Special considerations for fixing of specimens are included in the appropriate sections for each type of specimen.
5. Any questions should be directed to the Cytology Team at 953-1744 prior to obtaining specimens.

I. TURNAROUND TIME FOR CYTOLOGY REPORTS

1. GYN: Turn around time for normal, routine pap smears is usually ten days if the specimen is received in the morning. If any significant atypia is present the slide is reviewed, followed by referral to a pathologist, extending the time one to two days. Slides can be expedited and the results obtained the day of receipt if an emergency exists, but the requisition must be clearly marked as such, and not placed inside a group of chits. A phone call is the best method to assure that a "rush" is found and expedited.
2. NON-GYN: Routine specimens received in the morning have a 2 day turn around time. All NON-GYN specimens are screened by a CYTOTECHNOLOGIST then referred to a pathologist. Fine Needle Aspirations have a turnaround time of two days. Non-Gyn specimens, with the exception of the cellblock, can also be expedited if an emergency exists, with results obtained on the day of receipt.

FEMALE GENITAL TRACT SPECIMEN SUBMISSION

I. PURPOSE

To establish policies and procedures governing the proper collection and submission of specimens from the female genital tract.

II. GENERAL RULES IN OBTAINING SPECIMENS

NOTE: If patient is unable to understand the English language, please contact the OOD desk (x3-5008) for an interpreter.

- A. TIMING: It is best to obtain cervical smears at least 10 days to 2 weeks after the menstrual period. This is especially true in women over 40, where the presence of endometrial cells may be a clue to endometrial neoplasia.
- B. "Contraindications": It is possible to obtain "routine" cervical smears during a period of bleeding; however, in smears taken during bleeding there is a significantly greater chance that the specimen adequacy will be designated as limited or unsatisfactory due to obscuring blood. If the bleeding is abnormal or there is a question of a cervical lesion, obtaining cervical cytological material is not contraindicated and may be diagnostic.
- C. Bleeding and douching within 24 hours prior to taking the specimen are not contraindications to obtaining specimens. Specimens should be obtained when the first opportunity arises. However, these conditions do yield a higher percentage of unsatisfactory smears and the patient should be advised that it may be necessary to repeat the study.
- D. The exact site of origin of each specimen should be listed on the Gynecologic Exfoliative Cytology Examination chart. The choices for conventional glass slides are (a) Ectocervical-Endocervical, and (b) Vaginal.
- E. A pelvic examination of the patient should be carried out after obtaining the cytologic specimens.
- F. It is generally recommended not to use lubricant on the speculum when planning to do a Pap Smear. If there is excessive mucus present on the cervix, this may be gently removed utilizing a rectal swab before obtaining the pap smear. Cultures should be obtained after pap smear is done.
- G. Multiple devices that are currently in use for cervical/endocervical sampling.
 - 1. Modified Ayre type spatula with extended tip.
 - 2. Ayre spatula used in conjunction with a cytobrush.
 - 3. "Broom" cervix brush.

There is no place for the use of a cotton tip applicator in making a pap smear.

III. THINPREP PAP TESTS (Preferred Test)

A. To obtain a cervical/vaginal specimen for the detection of cervical/vaginal abnormalities to be submitted in a liquid based medium for thin layer slide preparation.

B. Materials Needed

1. Endocervical brush/Spatula or Broom-like collection device
2. Vial of PreservCyt Solution
3. Speculum
4. Rectal swab

C. PROCEDURE-USING THE ENDOCERVICAL BRUSH/SPATULA

1. Introduce the speculum **without** lubricant. If necessary, normal saline may be used to moisten the speculum.
2. Moisten the rectal swab with normal saline. Roll the swab across the ectocervix to remove excess mucus and debris.
3. Insert the plastic spatula and place against the ectocervix and rotate 360 degrees.
4. Remove the spatula and rinse the spatula as quickly as possible in the PreservCyt solution. Swirl the spatula vigorously, at least ten times.
5. Discard the spatula.
6. Insert the cytobrush into the endocervical canal and rotate $\frac{1}{4}$ of a turn (90 degrees).
7. Remove the cytobrush and rinse the brush, as quickly as possible in the PreservCyt solution, swishing 10 times and rubbing the brush against the side of the vial.

Do not allow either collection device to sit in the PreservCyt solution***

8. Tighten the cap so the black line (torque line) is beyond the black line (torque line) on the vial.
9. Record the patient's name (last, first and middle initial), family member prefix (FMP), sponsor's SSN and specimen collection date on vial.
10. Place the order for the ThinPrep Pap test in CHCS (refer to lab SOP).
11. Place the vial in a zip-lock, specimen bag and transport to the laboratory.

D. PROCEDURE-USING THE BROOM-LIKE DEVICE

1. Introduce the speculum **without** lubricant. If necessary, normal saline may be used to moisten the speculum.
2. Moisten a rectal swab with normal saline. Roll the swab across the ectocervix to remove excess mucus and debris and discard.
3. Insert the central bristles of the broom into the endocervical canal deep enough so the shorter bristles have full contact with the ectocervix.
4. Gently push, and rotate the broom in a clockwise direction five times.

5. Remove the broom and rinse the broom as quickly as possible into the PreservCyt solution by pushing the broom into the bottom of the vial 10 times, forcing the bristles apart. To dislodge the cells that have been collected.
6. Swirl the broom vigorously to further release material.

*** Do not allow the broom to sit in the PreservCyt solution***

7. Discard the collection device.
8. Tighten the cap so that the black line (torque line) passes the black line (torque line) on the vial.
9. Record the patient's name (last, first and middle initial), FMP (family member prefix) sponsor's SSN and specimen collection date on vial.
10. Place the order for the ThinPrep Pap test in CHCS (refer to laboratory SOP).
11. Place the vial in a zip-lock, specimen bag and transport to the laboratory.

E. REFERENCES

1. ThinPrep reference manual, CYTC Corp, Boxborough MA.
2. Laboratory Policy and Procedure Manual for Inpatient and Outpatient Care.

IV. **THE ENDOCERVICAL SMEAR**

- A. This technique may be utilized in addition to the cervical scraping smear. This method provides the best and most diagnostic cellular material for early cervical carcinomas or premalignant lesions.
- B. A cotton tip applicator is next to worthless for an endocervical sample and should not be used.
- C. The preferred device is an endocervical brush (cytobrush).
 1. Technique: Place the brush into the endocervical canal and, while rotating the brush, move the brush back and forth within the canal.
 2. Making the slide: Roll the brush linearly onto the slide back and forth and rapidly fix with cytology spray fixative or 95% ethyl alcohol.

V. **THE CONVENTIONAL GLASS SLIDE CERVICAL SMEAR**

- A. The smear is made by placing the small elongated end of the cervical scraper into the external os and high into the canal, rotating the spatula 360 degrees at least 2 - 3 times, thoroughly scraping the squamocolumnar junction and obtaining a good endocervical sample. This material dries very rapidly and must be spread on the pre-labeled slide and fixed immediately. Air drying distorts cellular material.
- B. This type of cervical smear will detect approximately 90-97% of early cervical carcinomas.

C. Materials Needed:

1. 1 cervical modified Ayre spatula with elongated tip (or cytobrush or "Broom" cervix brush).
2. 1 glass slide (one end with clear frosting). Writing the patient's name, FMP, and sponsor's social security number on the frosted end with a soft lead pencil identifies the slide. The slide must be labeled before obtaining the specimen.
3. 1 speculum (without lubrication).

D. Technique:

1. Using the extended tip of the Ayre spatula, insert into the visualized endocervical canal while rotating the spatula 360 degrees for 2-3 complete rotations. This usually provides an adequate sample for most patients.
2. If the Ayre spatula is used in combination with a cytobrush, the recommended technique is to first obtain a sample utilizing the spatula and "park" the spatula in the vagina while obtaining the endocervical specimen by placing the brush into the endocervical canal. Simultaneous rotation with small back and forth movements will obtain an adequate sample. Spread the cytobrush sample immediately onto the prelabeled slide in a linear fashion by rolling the brush. Immediately apply the Ayre spatula specimen over the same slide in a rotating fashion. Fix immediately with a commercial cytology fixative (an alternative is to use two slides, applying the material as soon as it is obtained).
3. If the "Broom" cervix brush is used, using gentle pressure, insert the long central bristles into the cervical os until the lateral bristles bend fully against the ectocervix. Maintain gentle pressure and rotate the "Broom" by rolling the handle between the thumb and forefinger 3 - 5 times to the left and right. Transfer the sample to the prelabeled slide with a single paintbrush stroke. First apply one side of the bristles, turn the brush over, and paint the slide again in exactly the same area. Apply the commercial fixative immediately according to fixative directions.

VI. **DIRECT SCRAPING SMEARS**

- A. These may be utilized in addition to the routine cervical scraping smear if a lesion is visible in the vaginal vault or on the labia.

B. Materials Needed:

1. Cervical spatulas (Ayre scrapers) or tongue depressors.
2. Glass slides (one end frosted). The slides are identified by writing the patient's name, FMP, and last 4 digits of sponsor's social security number on the frosted end of the slides with a soft lead pencil.
3. Speculum (without lubricant).
4. Commercial "Cytologic Fixative" or a bottle of 95% ethyl alcohol.
5. Paper clips to be placed on the frosted ends of the slides if 95% ethyl alcohol is to be used as the fixative.

C. Technique:

1. If the lesion is soft, moist and clean:
 - a. Scrape the lesion with a tongue blade, cervical scraper or edge of a scalpel blade.
 - b. Spread the material from the blade onto a clean slide and immediately fix by spraying or immersion in 95% ethyl alcohol.
2. If the lesion is dry or has a necrotic or an inflammatory surface:
 - a. Gently moisten and remove necrotic debris with a non-absorbent cotton swab that has been dipped in saline.
 - b. Discard this swab and debris.
 - c. Scrape the lesion with a tongue blade, cervical scraper or edge of a scalpel blade.
 - d. Spread the material onto a clean slide and immediately fix by spraying or immersion in 95% ethyl alcohol.

VII. **DES EXPOSURE (OFFSPRING) SMEARS**

A. These may be used to determine whether changes are present in females whose mothers took DES (Diethylstilbestrol) while the patient was in utero.

B. Care must be exercised in obtaining these smears to avoid any contamination from the cervix and vaginal pool area.

C. Materials Needed:

1. 5 cervical spatulas (Ayre scrapers) or tongue blades.
2. 5 glass slides (one end frosted). The slides are identified by writing the patient's name, FMP and last 4 digits of sponsor's social security number on the frosted end of the slides with a soft lead pencil. Each slide must also be labeled as follows: CX, V-ANT, V-R, V-L, and V-POST.
3. Speculum (without lubricant).
4. Commercial "Cytology Fixative" or a bottle of 95% ethyl alcohol.
5. Paper clips to be used when using the 95% ethyl alcohol fixation method. The vaginal smears will each have a paper clip placed over the frosted end to keep the slides apart in the bottle.

D. Technique:

1. Obtain the routine cervical scraping smear. Spread the material on the correct slide and fix immediately.
2. Using separate cervical spatulas or tongue blades, scrape one quadrant of the vaginal wall. When scraping, begin at the cervical-vaginal reflexion and scrape directly out towards the introitus. Spread the material on the correct slide and fix immediately. Continue with each vaginal quadrant.
3. If 95% ethyl alcohol is used for fixation, place the cervical slide in a separate bottle from the vaginal quadrant.
4. Include appropriate history on the cytology request form. Each slide should be labeled as to the site of origin of the smeared material. The final report will read for routine

detection as well as for the presence of changes consistent with DES exposure.

VIII. BUCCAL SMEARS FOR CHROMOSOMAL SEX DETERMINATION

Buccal smears for chromosomal sex determinations are discouraged. The preferred technique for chromosomal information is chromosome analysis. Contact the Laboratory's mail out section for information.

IX. BREAST SECRETION SMEAR

A. The preferred cytologic method for evaluating any palpable breast mass is a fine needle aspiration. However, smears of breast secretions may be utilized in the detection of breast cancers that involve ducts. This method is best utilized for a bloody discharge, or breast discharges in postmenopausal women. DO NOT MASSAGE OR SQUEEZE THE BREAST. Too vigorous manipulation may dislodge and spread malignant cells.

B. Materials Needed:

1. Glass slides (one end frosted). The slides are identified by writing the patient's name, FMP, and last 4 digits of sponsor's social security number on the frosted end of the slides with a soft lead pencil. Slides are further identified by indicating right or left breast.
2. Paper clips. These hold slides apart in fixative. Place a paper clip on the frosted end of each slide before obtaining a specimen.
3. Bottle of fixative (95% ethyl alcohol), available from Cytology.

NOTE: When 95% alcohol is not available, a commercial "cytology fixative" may be used, but is not the preferred fixative for breast specimens.

C. Technique:

1. Open bottle of fixative and have patient hold the bottle near the breast.
2. GENTLY express only the nipple and subareolar area of any secretions that may be lying in the collecting ducts. IF NO SECRETION APPEARS AT THE NIPPLE WITH THIS GENTLE COMPRESSION, DO NOT MANIPULATE FURTHER.
3. Allow a "pea" size drop of fluid to collect upon the nipple tip.
4. Immobilize the breast and, using the nipple, smear the material across a glass slide.
5. IMMEDIATELY, place the slide into the fixative. Time is of the essence here. Smearing the material across the slide and placing the slide in fixative should be accomplished in one motion.
6. Make as many smears as the amount of material allows.

NOTE: If specimens are obtained from both breasts, a separate non-GYN Cytology Examination Report should be used for the

specimens from each breast. Slides made from both breasts must be labeled as to which breast (Right or Left).

X. ESOPHAGEAL/GASTRIC BRUSHINGS

- A. The frosted end of each slide shall have the patient's last name, FMP, and last 4 digits of the sponsor's social security number written on one end of the slide with a soft lead pencil before the specimen is obtained.
- B. A smear is made of the brushing on the frosted side of the pre-labeled slide. The slide must then be immediately fixed in a bottle of 95% ethyl alcohol (available from the cytology processing room 85). The brush should be rinsed in a small bottle of fixative solution (available from the cytology processing room 85). The slides and fixative solution should be forwarded immediately to the cytology lab for processing.
- C. Subsequent pre-labeled slides shall have a paper clip placed over the end containing the identifying data to keep the slides separated in the fixative. The paper clips should be applied before the specimen is obtained.
- D. It is recommended that samples from different sites be placed in separate bottles of fixative and labeled accordingly.
- E. DUE TO RAPID CELLULAR DEGENERATION, RAPID FIXATION CANNOT BE OVER EMPHASIZED.

XI. RESPIRATORY TRACT

SPUTUM SERIES

- A. When a pulmonary lesion is suspected, a sputum series should be examined. The SPUTUM SERIES consists of FRESH, EARLY MORNING SPECIMEN EACH DAY FOR THREE DAYS. A post-bronchoscopy sputum specimen may be included in the series. The Sputum Series increases detection of primary bronchogenic carcinoma from 45% (one specimen) to 75% (three specimens). DO NOT submit 24-hour specimens.
- B. Materials Needed:
One wide mouth sputum collection assembly, or specimen collection cup with cover for each day (clean, dry, use fixative). The container shall be labeled with the patient's name, FMP, and the last 4 digits of the sponsor's social security number.
- C. Technique I:

NOTE: If patient is unable to understand the English language, please contact the OOD desk (X3-5008) for an interpreter.

1. Give the patient a clean specimen cup with cover the night before and instruct him not to use it until morning.

2. Instruct him to cough DEEPLY ("from the diaphragm") upon awakening and expectorate all sputum into the cup. Encourage the patient to expectorate deep SPUTUM not SALIVA.
3. The patient continues the deep coughing and expectorating until he has given five good deep coughs with expectoration.
4. The patient then returns the specimen to the nurse's station. It should then be brought directly to the Laboratory. If any delay is expected, the specimen should be refrigerated until it can be brought to the Laboratory.
5. Repeat the procedure each day for three days.

NOTE: For sputum collection on an outpatient basis, specimen containers with fixative solution should be used (available from cytology processing room 85). The patient should be instructed to follow the first three steps above. The patient should bring the specimen to the Laboratory no later than 0900 on the day it was collected. The specimen should be accompanied with the appropriate chit.

- D. Technique II - Post-Bronchoscopy (This is a most valuable specimen; more valuable than a single sputum)
1. Give the patient a clean specimen cup with cover before the bronchoscope is withdrawn. Be sure the container is labeled with the patient's name and sponsor's social security number. Also, label the container "POST-BRONCH SPUTUM."
 2. Have the patient cough deeply and expectorate ALL sputum into the cup until an adequate specimen is obtained.
 3. Collect the cup afterwards and take it with its chit immediately to the Laboratory. If any delay is expected, refrigerate until able to take to the Laboratory.
 4. If this specimen is part of a SPUTUM SERIES, have patient continue series as outlined in Technique I.

XIII. BRONCHOSCOPIC SPECIMENS

- A. Specimens for cytologic examination augment routine bronchoscopy with biopsy, they do not replace biopsy. Specimens may be obtained during bronchoscopy by ASPIRATION of secretions, DIRECT BRUSHING of suspicious areas, and BRONCHIAL WASHING. As the findings at bronchoscopy are usually not predictable beforehand, the clinician must be prepared to obtain material by any means which may prove to be most desirable at the time of the examination.
- B. Materials Needed:
1. One aspirator with short-inlet traps (Clerf, McKay, etc.).
 2. 2 (or more) frosted slides. Writing the patient's name, FMP and the last 4 digits of the sponsor's social security number on the end of the slide with a soft lead pencil before the specimens are obtained identifies the slides.
 3. 2 (or more) paper clips to hold the slides apart in the fixative. Place the paper clips on the end containing the identifying patient data before the specimens are collected.

4. One bottle of fixative (95% ethyl alcohol), available from Cytology.
5. 50 ml physiological solution and equipment for lavage.

C. Technique:

1. The surface of suspicious areas is:
 - (1) biopsied, (2) washed, and then (3) brushed. If insufficient secretions are present or a lesion is not visualized, rinsing the biopsy forceps in normal saline that has been used for the bronchial lavage will provide additional material for examination. FOR FULL DIAGNOSTIC VALUE, ALL MATERIAL SHOULD BE IDENTIFIED AS TO SITE OF ORIGIN.
2. Aspiration:
 - a. Aspirate secretions as encountered.
 - b. Label site of procurement and bronchial branches.
 - c. Set aspirations aside, properly labeled, until completion of the procedure.
3. Bronchial Washing:
 - a. Fill the bronchus to its carina with normal saline.
 - b. Aspirate the washing, label as to site of procurement, and set aside until completion of procedure.
4. Direct Smears:
 - a. Brush the surface of suspicious areas completely.
 - b. Withdraw the brush, quickly roll it on the frosted side of a labeled slide that is held over an open bottle of fixative and immediately place the slide into the fixative. Immediate fixation is essential to avoid air drying which occurs rapidly after the material is spread onto the slide.
 - c. If more than one site is brushed, the slides should be numbered #1, #2, and so forth.
 - d. Repeat in other suspicious areas using a fresh brush and another clean, numbered and identified slide.
 - e. Rinse the brush in a small container of fixative (available from cytology processing room 85) or place the whole brush in a small container of fixative and submit immediately to Cytology for processing.
5. After Examination is completed:
 - a. Before bronchoscope is withdrawn, give the patient a clean, dry specimen container with cover for POST-BRONCHOSCOPY SPUTUM (See Sputum Technique II).
 - b. Immediately upon completion of the bronchoscopy, take the properly labeled FRESH SPECIMENS and SMEARS to the Laboratory with the completed request chits.

XIII. **URINARY TRACT**

NOTE: It is imperative that all cytologic specimens of the urinary tract be identified as to SITE of urinary tract from which the specimen is obtained and as to the METHOD by which the specimen is collected. It is requested that all urine specimens be submitted to the cytology processing room 85 before 1100, if possible.

A. **VOIDED URINES**

1. It is preferred that all voided urines be obtained at Naval Medical Center Portsmouth. First voided morning specimens are the least desirable specimens because the cells have been exposed many hours to the cytotoxic effect of urine and should, therefore, be discarded.
2. A convenient method suggested for voided urine specimens is to have the patient void at home upon awakening (do not collect this voiding), and then report to the hospital two to three hours later where he/she may void the urine specimen to be used for cytologic examination. The patient should be instructed to drink a full glass of water after urinating at home (remember, the first morning specimen is not to be collected). The patient should be instructed to try to drink a full glass of water every half-hour after the first morning void until the time he/she arrives at the hospital two to three hours later to give the urine specimen.
3. All urine specimens should be fixed with equal volume of fixative (available from cytology processing room). Any specimen that cannot be taken to the Laboratory immediately should be refrigerated.

B. CATHETERIZED SPECIMENS

1. Catheterized specimens must be labeled as such since any specimen collected by instrumentation produces cytologic artifacts which, if not considered, could lead to false positive malignant diagnosis. Catheterized specimens should be collected without lubricant then sent to Cytology immediately without fixative.

C. BLADDER WASHINGS

1. Irrigation of the bladder with physiologic saline helps to exfoliate more transitional cells. All the saline injected into the bladder is withdrawn and submitted immediately to the Laboratory for processing.

D. URETHRAL AND PELVIC SPECIMENS

1. When there is a question of a lesion in the upper urinary tract, urethral and pelvic urine specimens may be collected during cytoscopy. Great care should be exercised to prevent mix-up of specimens from left and right ureters and a bladder lesion. All specimens must be labeled to the exact source.

E. URETHRAL BRUSHES

1. Urethral brush specimens and renal pelvis brush specimens: The brush should be quickly spread in a circular motion on a frosted end slide. No drying of the slide is permissible. The slide should be labeled and an open jar of 95% alcohol should be at hand before the brush is removed from the patient. Alternatively, a second person should be ready to spray the slide with commercial "Cytology Fixative" before any air drying can occur. The brush then should be washed or submitted in a small bottle of fixative obtained from the cytology processing room 85 and returned immediately for processing.

XIV. BODY CAVITY FLUIDS: PLEURAL, PERICARDIAL, PERITONEAL, JOINT

- A. Pleural, pericardial, peritoneal, and joint fluids should be submitted FRESH AND UNFIXED. An easy means is to submit the specimen in the syringe used for the aspiration- **WITH THE NEEDLE REMOVED.**
- B. Exfoliated cells from these sites deteriorate both in and out of the body. This deterioration is especially rapid in the presence of blood. Therefore, if possible, it is most important that these be obtained during normal working hours so that they may be processed immediately.
- C. If an extreme emergency requires that a sample be obtained outside normal working hours, the specimen should be immediately brought to the Laboratory. The Laboratory staff should be instructed to place the specimen and accompanying chit in the refrigerator located in the cytology processing room immediately. There will be some cellular degeneration, but this is lessened by prompt refrigeration.

XV. CEREBROSPINAL FLUID

A. SPECIMEN COLLECTION

NOTE: If a patient is unable to understand the English language, please contact the OOD desk (x3-5008) for an interpreter.

1. Any cerebrospinal fluid intended for cytologic examination should be for cytology use alone. Extra samples should be obtained for other testing.
2. Materials needed:
 - a. Spinal tap tray
 - b. Four sample tubes labeled #1-#4 with the patient's name, FMP, and sponsor's social security number.
3. Technique:
 - a. Perform spinal tap.
 - b. Place only a small amount of fluid in tube one. This is to clear the needle of blood.
 - c. Obtain cerebrospinal fluid in tubes #2-#4. One to two mL is generally the minimum amount required for processing; several mL may aid in diagnosis, especially if malignancy is suspected.
 - d. Send the tubes, with chit, to the Laboratory immediately, (cellular deterioration is rapid).
 - e. When CSF is sent on a patient and the physician doesn't specify what tests are to be run on each tube, the following protocol will be used:
 - i. Tubes 1 will go to Hematology for a Cell Count. Tube 4 will be sent to Cytology if cytologic studies have been requested.
 - ii. Tube 2 will be sent to Microbiology.
 - iii. Tube 3 will be sent to Chemistry.

NOTE: If less than 4 tubes are sent to the laboratory, Hematology will always process the last tube.

NOTE: If possible, specimens should only be collected during normal working hours. Specimens should be brought immediately to the Laboratory Specimen Receiving window for processing. Samples will be refrigerated at 2-8°C if they cannot be processed immediately. If any questions arise regarding specimen handling, call the duty pathologist. Under no circumstances should CSF specimens be left in the window without the knowledge of a technician after normal working hours.

NOTE: All bacterial antigen assays on CSF specimens are required to have a bacterial culture performed at NMCP.

XVI. CYTOLOGY MISCELLANEOUS INFORMATION

DIRECT SCRAPING SMEARS (MOUTH, PHARYNX, SKIN, etc.)

A. Materials needed:

1. Tongue depressor or scalpel blade.
2. Non-absorbent cotton swabs (cotton swabs must not be contaminated by epithelium from the examiner's or patient's skin).
3. Physiological solution.
4. Glass slides (one, end frosted). The slides are identified by writing the patient's name, sponsor's social security number on the frosted end of the slides with a soft lead pencil.
5. Bottle of fixative (95% ethyl alcohol), available from Cytology.

B. Technique:

NOTE: If patient is unable to understand the English language, please contact the OOD desk (X3-5008) for an interpreter.

1. If the lesion is moist:
 - a. Open the bottle of fixative.
 - b. Scrape the lesion with a tongue depressor, or scalpel blade.
 - c. Smear the material from the blade onto a glass slide that is held over the open bottle of fixative and immediately place the slide into the fixative.
2. If the lesion is dry or has a necrotic and inflammatory surface:
 - a. Open the bottle of fixative.
 - b. Gently moisten and remove the necrotic debris with a non-absorbent cotton swab that has been dipped in saline.
 - c. Discard the swab and debris.
 - d. Using a second non-absorbent cotton swab that has been moistened with saline, gently rub the margins of the lesion.
 - e. Quickly roll the swab on a glass slide that is held over the open bottle of fixative and immediately place the slide into the fixative.

XVII. WASHINGS, ASPIRATES, and EXUDATES (SINUS WASHINGS, etc.)

A. Materials Needed:

1. Physiologic solution.

B. Technique:

1. Irrigate with physiologic solution.
2. Collect all fluid.
3. Send specimen to Laboratory immediately.

NOTE: Cellular degeneration will occur rapidly. Attempts should be made to perform procedure during normal cytology working hours. If after hours specimen collection is a must, bring specimen directly to the Laboratory. Instruct laboratory personnel to

place specimen and its chit in the refrigerator in the cytology processing (room 85).

XVIII. OTHER PROCEDURES:

- A. Telephone the Cytology Team during normal working hours at 953-1744/1745 for specific instructions before doing any procedure not described in this manual.
- B. After hours, consult with duty pathologist.

XIV. FINE NEEDLE ASPIRATIONS

- A. Fine needle aspiration (FNA) cytology, also known as aspiration biopsy cytology, may be extremely helpful in management of patients with both suspected and known malignancies. Fine needle aspiration consists of inserting a small gauge needle (#22 or smaller) through skin or mucous membranes into a mass which has been identified by palpation or radiological studies. Fine needle aspiration is most helpful in the confirmation of malignancy, either for primary diagnosis or confirmation of recurrence. However, many benign lesions (fibroadenoma, Warthin's tumor, etc.) can also be reliably diagnosed. Some of the situations in which this technique has been found most useful are listed below:
 - 1. Cold thyroid nodules.
 - 2. Enlarged salivary glands - diffuse or focal/ nodular.
 - 3. Enlarged lymph nodes - most useful in detecting metastatic disease. Lymphomas can be suggested by fine needle aspiration, but usually require an open biopsy for confirmation and classification for initial diagnosis.
 - 4. Breast masses greater than 0.5 cm in diameter.
 - 5. Pulmonary nodules.
 - 6. Abdominal masses.
 - 7. Soft tissue masses of extremities.
 - 8. Lytic bone lesions.
 - 9. Evaluation of para-aortic nodes such as in patients with cervical cancer.
 - 10. Prostatic lesions.

B. GUIDELINES

- 1. The fine needle aspiration procedure is rapid and carries little risk to the patient. In our institution there have been no major complications. The minor complications associated with this procedure are minor hemorrhage and/or, rarely, local infection. Fine needle aspirations done on deep masses in the thorax or abdomen under radiological guidance may carry slightly more risk as determined by the specialist performing the procedure. For example, fine needle aspirates of the thorax may result in pneumothorax. In general, for subcutaneous masses that are palpable, the discomfort to the patient is usually no more than that associated with blood drawing, although this may vary with each individual patient. The physician performing the fine needle aspiration should complete an operation or procedure

permit. The risk of "tumor seeding" is no longer considered clinically significant when small needles (21 gauge or smaller) are exclusively utilized.

2. Fine needle aspiration cytology is a relatively rapid tool and in emergency situations, when no special studies or tests are required, diagnosis can be made the same day the aspiration is performed. A preliminary diagnosis can often be rendered on selected slides within 30 minutes if clinically required. Complicated cases may take longer. In general, there will be a two day turn around period.
3. Preparation of the material (smearing of the slides and fixation) is critical. Improperly fixed slides are non-diagnostic. The nature of the lesion including appearance and quantity of the material obtained during aspiration may modify processing of the sample. Personnel from the anatomic pathology division should be present to process the aspirated specimen. The staff cytopathologist is usually available to perform the procedure, or to assist a physician requesting technical assistance. If the physician is familiar with the procedure for fine needle aspirations, or if the cytopathologist is unavailable, he/she may request that a cytotechnologist be present to help make the smears and process the material.
4. Fine needle aspirations are performed on alternating Monday and Wednesday of each week on an appointment basis. Appointments may be made in person at the check-in desk in the Laboratory or by calling 953-1623. The patient should be sent to the Laboratory on 1st Floor, North Mall, Bldg 2 with a completely filled out NON-GYN cytology chit between the hours of 0900-1530. Adequate clinical history and specific identification of the site to be sampled, including a diagram if appropriate, are essential. Questions may be directed to the Cytology Office (ext. 3-1744/1745). The cytopathologist may be reached via the same number, the Laboratory Administration Office (ext.3-1708), or by pager. Biopsies may be performed in the biopsy suite in the main laboratory, in the clinics, or on the ward if the patient is not easily transported.
5. Fine needle aspirations requiring guidance by radiological or ultrasound procedures should be scheduled through the radiology department. The requesting physician and the radiology department should then coordinate the procedure (time and place) with cytology personnel.

C. REPORTS

1. Reports will include assessment of adequacy, descriptive diagnosis, and any recommendations for follow-up. If the specimen is sub-optimal or inadequate, or if cytologic findings are equivocal, a repeat aspiration may be recommended. If findings are suspicious for malignancy, but

less than fully diagnostic, a repeat aspiration biopsy or an open biopsy may be recommended.

2. If sampling is adequate, a "negative" result provides clinically useful information (e.g., benign reactive lymph, benign colloid nodule of thyroid). A "false-negative" may result from technical problems, usually inadequate or incomplete sampling of a lesion or organ, or, uncommonly, interpretive error. If clinical findings, especially change or growth of a lesion, or radiographic findings contradict the FNA result, a repeat aspiration biopsy or an open biopsy must be pursued.

D. OBTAINING CYTOLOGY RESULTS

1. Distribution of cytologic examination results is routinely made by CHCS computer. However, there may be an instance where a clinician will need to call for a specific report.

SPECIMEN SUBMISSION FOR INFLUENZA PCR TESTING

I. PURPOSE/PRINCIPLE:

- A.** The use of Polymerase Chain Reactions (PCR) permits identification of non-cultivable or slow growing microorganisms or viruses. The basis for PCR diagnostic applications in microbiology is for the detection of infectious agents and for the discrimination of non-pathogenic strains by virtue of specific genes.
- The purpose of this procedure is to provide instruction on the collection of specimen to be tested with the current Center for Disease Control (CDC) Influenza Real-Time PCR (rRT-PCR).

II. SPECIMEN INFORMATION:

1. Specimen type:
 - a. Posterior-pharyngeal (throat) swabs
 - b. Nasal or naso-pharyngeal swabs
 - c. Nasal aspirate
 - d. Tracheal aspirate
 - e. Bronchoalveolar lavage.
 - f. Viral Cell culture: (training, proficiency assessment and reagent QC)
 - g. For H1N1 testing, respiratory wash specimens are acceptable.
2. Swab specimens are only to be collected on swabs with a synthetic tip (nylon, polyester or Dacron) and an aluminum or plastic shaft.
3. Swabs are placed into Viral Transport Media (VTM) or Universal Transport Medium (UTM) by the ward staff prior to shipping as described in CDC and WHO guidelines (<http://www.who.int/csr/resources/publications/surveillance/Annex8/pdf> or <http://www.cdc.gov>).
4. All specimens must be accompanied by the case report form. This form must be completed and have all the clinical information meeting the case definition.

**POINT OF CARE TESTING POLICIES AND PROCEDURES
(Refer to NAVMEDCENPTSVAINST 6510.1 Series)**

Each Point of Care Testing Site (POCT) is equipped with a POCT SOP. For collection requirements, testing procedures, results reporting, MSDS and other matters that pertain to point of-care, please refer to site's POCT SOP and NAVMEDCENTPTSVAINST 6510 series. You may also contact the Point of Care Department at 953 1560/1653/7918/1649 or the POCT pager at 314-8551 or 314-8816.

**NAVAL MEDICAL CENTER PORTSMOUTH
POINT OF CARE TESTING
NORMAL AND CRITICAL VALUES**

TEST	NORMAL	*CRITICAL VALUE*
ACCU-CHEK INFORM METER GLUCOSE	ADULT : 70-99 MG/DL	LESS THAN OR EQUAL TO 40 MG/DL, GREATER THAN OR EQUAL TO 400 MG/DL
	31 DAYS TO 18: 60-99 MG/DL	
	2 TO 30 DAYS: NEWBORN, 1 DAY : 40-60 MG/DL	LESS THAN OR EQUAL TO 40 MG/DL, GREATER THAN OR EQUAL TO 300 MG/DL
FECAL OCCULT BLOOD	NEGATIVE	POSITIVE
GASTRIC OCCULT BLOOD	NEGATIVE	POSITIVE
HEMOCUE HEMOGLOBIN	M: 14-18 G/DL F: 12-16 G/DL	LESS THAN OR EQUAL TO 7.0, GREATER THAN OR EQUAL TO 20.0G/DL
RAPID STREP	NEGATIVE	POSITIVE
HCG	NEGATIVE	UNKNOWN POSITIVE IN A PRE-OP PATIENT
PPM-PROVIDER PERFORMED MICROSCOPY	NO PARASITES OR FUNGAL ELEMENTS PRESENT, NORMAL URINE CAN CONTAIN SOME ELEMENTS WBC 0-5/hpf RBC 0-3/hpf EPITHELIAL CELLS 0-10/HPV MUCUS NONE TO TRACE ALL OTHER ELEMENTS: NONE	DETERMINED BY PROVIDERS
URINALYSIS	LEUKOCYTES: NEG NITRATES: NEG UROBILOGEN: 0.2-1.0 EU/DL PROTEIN NEG pH 5.0-7.0 BLOOD NEG SPECIFIC GRAVITY 1.010-1.030 KETONES NEG BILIRUBIN NEG GLUCOSE NEG	THE COMBINATION OF A KETONE RESULT GREATER THAN OR EQUAL TO 80MG/DL AND A GLUCOSE RESULT GREATER THAN OR EQUAL TO 500 MG/DL
ACTIVATED CLOTTING TIME	SYSTEMIC: 250-270 SEC TIGHT SYSTEMIC: 190-210 SEC HEMODIALYSIS: 150-180 SEC CARDIAC CATH: 80-160 SEC	CLINIC/PROCEDURE SPECIFIC

These reference ranges may not apply to all ages, genders, or patients on certain medications.

*The HEALTHCARE PROVIDER must be notified immediately. Documentation must be made in the medical record including the date, time and who made the notification.

Patient Identification or

Label:

**NAVAL MEDICAL CENTER PORTSMOUTH
POINT OF CARE TESTING
NORMAL AND CRITICAL VALUES**

TEST	NORMAL			*CRITICAL VALUE*
H. PYLORI	NEGATIVE			POSITIVE
<u>i-STAT</u> SODIUM	<u>ARTERIAL</u> 138-146	<u>VENOUS</u> 138-146	<u>UNITS</u> mmol/L	LESS THAN OR EQUAL TO 125, GREATER THAN OR EQUAL TO 160
POTASSIUM	3.5-4.9	3.5-4.9	mmol/L	LESS THAN OR EQUAL TO 2.8, GREATER THAN OR EQUAL TO 6.0
IONIZED Ca	1.12-1.32	1.12-1.32	mmol/L	LESS THAN OR EQUAL TO 0.86 GREATER THAN OR EQUAL TO 1.74
pH	7.31-7.41	7.25-7.50		LESS THAN 7.20
PCO2	41-51	35-50	mmHg	GREATER THAN 60
PO2	80-105	50-80	mmHg	LESS THAN 40
HEMATOCRIT	38-51	38-51	%	LESS THAN OR EQUAL TO 20%, GREATER THAN OR EQUAL TO 60%
BASE EXCESS	(-2) – (+3)	NA	mmol/L	NOT APPLICABLE
O2 SAT	95.0-98.0	NA	%	
HCO3	8-26	8-26	mg/dL	
TCO2	23-27	24-29	mmol/L	
CREATININE	0.6-1.3	0.6-1.3	mg/dL	LESS THAN 10, GREATER THAN 40 GREATER THAN 5.0
GLUCOSE	70-105	70-105	mg/dL	LESS THAN OR EQUAL TO 40, GREATER THAN OR EQUAL TO 400
UREA NITROGEN	8-26	NA	mg/dL	GREATER THAN OR EQUAL TO 80
HEMOGLOBIN	12-17	12-17	g/dL	LESS THAN OR EQUAL TO 7.0, GREATER THAN OR EQUAL TO 20.0
ANION GAP	10-20	NA	mmol/L	NOT APPLICABLE
<u>AVOX</u>				
<u>Oxyhemoglobin (arterial):</u>	92-100		%	** See Note
<u>Oxygen content:</u>	1.10-20.85		mg/dl	

These reference ranges may not apply to all ages, genders, or patients on certain medications.

*The HEALTHCARE PROVIDER must be notified immediately. Documentation must be made in the medical record including the date, time and who made the notification.

** Oxyhemoglobin critical values are determined on a case by case basis by the cardiologist performing the catheterization.

Patient Identification or Label:

Appendix A

Use the Hyperlink below to:

[GUIDELINES AND REGULATIONS FOR THE BLOOD BANK](#)

(<https://webapps.mar.med.navy.mil/nmcpadmin/viewinfo/instrlist.asp?ssic=6530&Submit=Go>)